

DESCRIPTION OF PROJECT

COUNTY OF CHESTERFIELD, VIRGINIA
PROPOSED (WATER/SEWER) IMPROVEMENTS
(LOCATION)
COUNTY CONTRACT NO.
(ENGINEER'S NAME) PROJECT NO.

 L.F. of " , L.F. of " and L.F. of
 " line
 .

INSTRUCTIONS TO BIDDERS

1. **DATE AND PLACE OF BID OPENING.** Sealed bids on behalf of the County of Chesterfield, Virginia, will be received at the office of the Director of Purchasing, Room 402, Fourth Floor, Chesterfield Administration Building, 9901 Lori Road Chesterfield, Virginia 23832 until but no later than _____ local time prevailing, _____, 2_____, and then publicly opened and read immediately thereafter for the following:

The Chesterfield County Contract No. for this project _____.
Drawings and specifications which include the proposal form may be
obtained from _____ (Engineer and Address) _____ for
\$ _____. Drawings and specifications are nonrefundable.

Time is of the essence and any bid received after the announced time and date for submittal, whether by mail or otherwise, will be rejected. The time of receipt shall be determined by the time clock stamp in the Purchasing Department. Bidders are responsible for ensuring that their bids are stamped by Purchasing Department personnel before the deadline indicated. Late bids received will be so noted in the bid file in order that the vendor's name will not be removed from the subject commodity/service list.

2. **CERTIFICATE OF REGISTRATION.** If a contract for construction, removal, repair or improvement of a building or other real property is for Seventy Thousand Dollars (\$70,000) or more, or if the total value of all such contracts undertaken by Bidder within any twelve-month period is Five Hundred Thousand Dollars (\$500,000) or more, the Bidder is required under Title 54.1, Code of Virginia (1950), as amended, to be licensed by the State Board of Contractors as a "CLASS A CONTRACTOR". If such a contract is for Seventy-five Hundred Dollars (\$7,500) or more [One Thousand Dollars (\$1,000) for electrical, plumbing and HVAC work] but less than Seventy Thousand Dollars (\$70,000), the Bidder is required to be licensed as a "CLASS B CONTRACTOR". If such a contract is for One Thousand Dollars (\$1,000) or more but less than Seventy-five Hundred Dollars (\$7,500) and is not for electrical, plumbing and HVAC work, the Bidder is required to be licensed as a "CLASS C CONTRACTOR". The Contractor license shall have the appropriate specialty classification that is predominant for the respective work. The Bidder shall indicate in the space provided whichever of the following notations is appropriate, inserting his contractor license number and specialty.

Licensed Class A Virginia Contractor No. _____
Specialty _____

Licensed Class B Virginia Contractor No. _____
Specialty _____

Licensed Class C Virginia Contractor No. _____
Specialty _____

If the Bidder shall fail to provide this information on his bid or on the envelope containing the bid and shall fail to promptly provide said Contractor license number to the County in writing when requested to do so before or after the opening of Bids, he shall be deemed to be in violation of Section 54.1-1115 of the Code of Virginia (1950), as amended, and his bid will not be considered.

If a Bidder shall fail to obtain the required license prior to submission of his bid, the bid shall not be considered.

3. **RESPONSIBILITY OF BIDDER.** The Bidder shall make a careful examination of the project site, shall familiarize himself with existing conditions, and shall satisfy himself as to the quantity and quality of materials and workmanship required for the Work. He shall carefully and thoroughly examine the Plans, General Conditions, Technical Specifications, Bid Form, Agreement and Forms of Bonds before submitting a Bid.

Request for interpretation of plans and specifications should be sent to the Engineer to be given consideration and must be received at least five days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instruction will be in the form of written addenda to the specifications which, if issued, will be mailed to all prospective bidders (at the respective addresses furnished for such purposes), not later than three days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the contract documents.

The submission of a Bid shall constitute a warranty by the Bidder that he has complied with the requirements of this paragraph. The Bidder is bound by his bid and his bid reflects an affirmative representation that he has examined the project thoroughly.

4. **FORM OF BID.** All Bids must be made on the Bid Form contained herein. The Bidder shall type or write in ink, both in words and in numerals, the price for which he proposes to furnish all materials, plant, equipment, tools, sheeting or bracing, scaffolds and other facilities; and to perform all labor and services necessary or proper for the completion of the work in strict accordance with the true intent of the Plans and Contract Documents, and subject at all times to the approval of the Director of Utilities. Each Bidder must correctly sign his Bid in longhand and in ink, giving the correct post office address of his firm. All Bids must be signed with the firm name and by an officer having the authority to bind the company or firm by his signature. If the Bidder is a corporation and the individual signing the Bid is not the President or a Vice President of the Bidder, proof of the authority of the individual signing to bind the Bidder must be submitted with the Bid. If the Bidder is a partnership, copies of appropriate documents relating to the authority of the individual signing to bind the partnership must be submitted with the Bid.

No interlineation, alteration or erasure of the Bid will be accepted. No oral, telegraphic, or telephonic proposals, modifications, or interpretations will be considered. Bids concerning separate bid invitations, must not be combined on the same form or placed in the same envelope. Bids submitted in violation of this provision may not be considered.

5. **BID GUARANTY.** Each Bid must be accompanied by a Bid Bond or certified check for an amount not less than 5 percent of the total amount of the Bid, as evidence of good faith and as a guaranty that, if awarded the project, the Bidder will execute the Contract and furnish the required Bonds.

If a Bid Bond is offered as guaranty, the Bond must be on a form acceptable to the Owner, and made by a Surety Company qualified and authorized to do business in the State of Virginia and must be signed or countersigned by an agent qualified for the execution of such instruments and must include necessary papers to show himself qualified, such as a current power of attorney. If a certified check is offered as guaranty, it shall be made payable to Treasurer, Chesterfield County, Virginia. The Owner will return all certified checks to the Bidders once the Contract has been executed by the successful Bidder.

6. **DELIVERY OF BID.** Each Bid must be submitted in an envelope and plainly marked with the project name and number. The name, correct post office address and Virginia Contractor No. of the Bidder shall be shown on the outside of the envelope. No Bid shall be considered which has not been received by the Owner prior to the time and date fixed for the opening of bids. If sent by mail (preferably registered), the sealed Bid marked as described above shall be enclosed in an additional envelope addressed to the Owner.
7. **OMISSIONS AND DISCREPANCIES.** Should a Bidder find discrepancies in, or omissions from, the plans or other Contract Documents, or should he be in doubt as to their meaning, he should at once notify the Engineer who may issue a written instruction to all Bidders.
8. **WITHDRAWAL OF BIDS.** No bid can be withdrawn after the scheduled closing time for receipt of bids for sixty (60) calendar days, except as provided in Section 2.2-4330(i), Code of Virginia which states that the bidder shall give notice in writing of his claim of right to withdraw his bid within two business days after the conclusion of the bid opening procedure. Any withdrawal request made to the Director of Purchasing must be accompanied by bidder's original work papers, or such request will be rejected. In order for work papers, documents and materials submitted pursuant to this section to be deemed a trade secret or proprietary information pursuant to Code of Virginia, subdivision F of subsection 2.2-4342, a bidder must expressly invoke the aforementioned statute in the notice or withdrawal and specifically state the reasons why protection under 2.2-4342F is necessary.
9. **REJECTION OF BID.** The Owner reserves the right to waive irregularities and technicalities and to reject any and/or all Bids. Without limiting the generality of the foregoing, any Bid which is incomplete, obscure, or irregular may be rejected; any Bid having interlineation, erasures or corrections may be rejected; any Bid accompanied by an insufficient or irregular certified check or Bid Bond may be rejected. Not more than one Bid from any individual, firm partnership, or corporation, under the same or different names, shall be submitted. Reasonable grounds for believing that any Bidder is interested in more than one Bid on the same project will cause the rejection of all Bids in which the Bidder is interested.

10. **SUBCONTRACTORS**. The Bidder's attention is called to the requirement that not more than fifty (50) percent of the work shall be subcontracted and that the amount of any subcontracts proposed by the Bidders shall be identified on the Bid Form.
11. **RESTORATION OF PRIVATE PROPERTY**. On those projects where work is to be performed on private property, the County has obtained easements. The standard easement agreement states that any structures, landscaping (except for trees, limbs and undergrowth) and the surface of the easement shall be repaired or restored as nearly as possible to their original conditions. Any special requirements for restoration shall be shown on the plans or as directed by the inspector.
12. **ACCEPTANCE OF BID AND ITS EFFECT**. The Contract, if awarded, will be to the lowest responsible Bidder whose Bid complied with the requirements of the Owner. The Owner will either award the project or reject all Bids received within sixty (60) days after the formal opening of Bids. The acceptance of a Bid will be a written Notice of Award, signed by the Owner, and no other act shall constitute the acceptance of a Bid. The bid shall be deemed accepted by the County upon mailing of the Notice of Award.
- The successful Bidder shall execute four (4) copies of the Agreement and furnish satisfactory Performance Bond, Labor and Material Payment Bond, and necessary certificates of insurance within fifteen (15) days after Notice of Award. Failure to so execute the Agreement will result in forfeiture of the Bidder's claim to the work and his Bid Bond or guarantee will be retained by the Owner to the extent necessary to make up the difference between the Bid and the second low bid.
13. **BID AMOUNT**. If the bid from the lowest responsible bidder exceeds available funds, the Owner may negotiate with the low bidder to obtain a contract price within available funds.
14. **DISABILITY PROVISION**. If you are an individual with a disability and require a reasonable accommodation, please notify the Chesterfield County Purchasing Department at (804) 748-1617, three working days prior to need.

15. **QUALITY EXPECTATION STATEMENT.** Chesterfield County, through its "Total Quality Improvement" initiative, is a recognized leader in providing quality products and services at the most effective cost possible. Therefore, the County fully expects, requires, and shall hold all Contractors, and all agents, staff, representatives, and subcontractors of the Contractor, responsible for, and accountable to, the highest quality standards of professional workmanship, products and services. In the spirit of the county's total quality improvement initiative, the Contractor shall be expected to become a member of the team and perform or provide all work, services and products with a target of "zero defects - zero rework".

16. **AWARD PHILOSOPHY.** Chesterfield County will make award to the lowest responsible and responsive bidder. The lowest responsive bidders) may be required to furnish a written statement of their qualifications, to include references, prior to any such award. The County may contact all references furnished by bidders. The right is further reserved by the County to contact references other than, and/or in addition to, those furnished by the bidder.

If, in the sole opinion of the County, a bidder is determined to be non-responsible as a result of any investigation conducted by or for the County, award will not be made to that bidder.

17. **PROPRIETARY INFORMATION.** Section 2.2-4342 of the Code of Virginia states: "Trade secrets or proprietary information submitted by a bidder, offeror, or contractor in connection with a procurement transaction shall not be subject to public disclosure under the Virginia Freedom of Information Act; however, the bidder, offeror, or contractor must invoke the protection of this section in writing and prior to or upon submission of the data or other materials, and must clearly and specifically identify the data or other materials to be protected and state the reasons why protection is necessary. Bidders, offerors, or contractors may not declare their entire bid or proposal as proprietary, nor may they declare any pricing as proprietary.

18. **COMMITMENT TO DIVERSITY AND CHESTERFIELD BUSINESSES.** Chesterfield County is a rapidly growing progressive community consisting of an increasingly diverse population. This diversity provides for a dynamic and robust community that promotes growth. Chesterfield County believes that all of its citizens should benefit from this economic growth without regard to race, color, religion or economic status.

The county is committed to increasing the opportunities for participation of minority business enterprises, woman-owned businesses and businesses located in Chesterfield County to ensure diversity in its procurement and contract activities. These businesses are encouraged to respond to all Invitations for Bids and Requests for Proposals. In addition, the county strongly encourages each contractor and/or supplier with which the county contracts to actively solicit minority business enterprises, woman-owned businesses and businesses located in the county as subcontractors/suppliers for their projects.

Upon award of the contract, the successful bidder shall furnish data requested on the Certification of Subcontractor/Supplier Activity form included in this IFB document. This information will enable the county to document the dollar level of activity and measure the success of its purchasing and contracting efforts in this endeavor.

19. **DEFINITIONS.** For purposes of Chesterfield County's classification and reporting program, in cooperation with the Virginia Department of Minority Business Enterprise, the following definitions apply:

Woman-Owned Business (WOB) - a business concern that is majority owned by a woman who also controls and operates the business. In this context, "control" means exercising the power to make policy decisions, and "operate" means being actively involved in the day-to-day management.

Minority Business Enterprise (MBE) - a business enterprise that is owned and controlled by one or more socially and economically disadvantaged persons. Such disadvantage may arise from cultural, racial, chronic economic circumstances or background or other similar cause. Such persons include, but are not limited to: African Americans, Asian Americans, Native Americans, Eskimos and Aleuts. (Reference: 2.1-6432.1 of the *Code of Virginia*)

Chesterfield Business (CB) - any private business enterprise, located within the jurisdictional boundaries of Chesterfield County.

20. **OFFICE CLOSURE.** In the event that Chesterfield County government offices are closed due to inclement weather and/or emergency situations at the time set aside for a pre-bid meeting and/or the published bid opening, the pre-bid meeting and/or bid opening date will default to the next open business day at the same time.

The following form will be sent to the contractor by the Purchasing Department for completion at the time of award, as appropriate.

CERTIFICATION OF ACTIVITY OF MINORITY BUSINESS ENTERPRISES,
WOMAN-OWNED BUSINESSES, AND CHESTERFIELD BUSINESSES WHO ARE
SUBCONTRACTORS/SUPPLIERS FOR THIS PROJECT/CONTRACT

Contractors shall furnish the information requested below regarding subcontractor(s) or supplier(s).

Name and Address of Subcontractor/Supplier	(√) MBE	(√) WOB	(√) CB	Commodity or Service	Dollar Amount

If a continuation of this list of subcontractors/suppliers is needed, please attach additional pages to this form.

I have no MBE, WOB or CB applicable to this contract _____(√)

Contractor hereby certifies that the above information is correct.

Complete Legal Name of Firm: _____ Date: _____
(Type or Print)

Form Prepared By: _____

Project Name/Number: _____

The following form will be sent to the contractor by the Purchasing Department for completion at the time of award/renewal, as appropriate.

CERTIFICATION OF ACTIVITY OF MINORITY BUSINESS ENTERPRISES,
WOMAN-OWNED BUSINESSES, AND CHESTERFIELD BUSINESSES WHO ARE
SUBCONTRACTORS/SUPPLIERS FOR THIS PROJECT/CONTRACT

Contractors shall furnish the information requested below regarding subcontractor(s) or supplier(s).

Name and Address of Subcontractor/Supplier	(3) MBE	(3) WOB	(3) CB	Commodity or Service	Dollar Amount

If a continuation of this list of subcontractors/suppliers is needed, please attach additional pages to this form.

I have no MBE, WOB or CB applicable to this contract _____(3)

Contractor hereby certifies that the above information is correct.

Complete Legal Name of Firm: _____ Date: _____
(Type or Print)

Form Prepared By: _____

Project Name/Number: _____

BID FORM

To: _____
For the Construction of: _____

The undersigned Bidder has carefully examined the site of work, the Plans, the General Conditions, Technical Specifications, the Agreement, and the Form of Performance and Labor and Material Payment Bonds for the construction of the above named project, and in compliance with the Advertisement and/or Bid Document dated _____ will provide all the necessary machinery, tools, apparatus, and other means of construction, and do all the work and furnish all materials called for in accordance with the requirements of the County and the true intent of the Contract Documents, and will complete the Contract within _____ calendar days.

For the Total Sum of: _____
_____ () DOLLARS

The undersigned Bidder further understands that all supplies and materials covered by this Bid shall be new and of the best quality and the highest grade workmanship. The Bidder certifies by the submission of this Bid that there has been no violation of copyrights or patent rights in manufacturing, producing, or selling the product or services shipped or ordered as a result of this Bid. The successful Bidder shall, at his own expense, defend any and all actions or suits charging such infringements, and will save Chesterfield County, its officers, employees, and agents harmless from any and all liability, loss, or expense occasioned by any such violation.

The Bidder acknowledges receipt of the following Addenda:

Accompanying this Bid is a Bid Bond/certified check in the amount of _____ payable to Treasurer, Chesterfield County, Chesterfield Courthouse, Virginia, which is to be forfeited to the extent necessary to make up the difference between the Bid and the second low bid, or if the undersigned shall fail to execute the Agreement and furnish satisfactory Performance and Labor and Material Payment Bonds under the conditions and within the time specified. If the Bid Bond or guarantee is not sufficient to make up the difference between the Bid and the second low bid, together with any consequential damages, the undersigned Bidder agrees to pay the Owner any losses in excess of the bond or guarantee.

The undersigned Bidder agrees to begin the work not later than ten (10) days after the date specified in the Notice to Proceed and to prosecute the work in such manner as to complete it within the time limit as set forth above. In the event the said work is not completed within the time limit above stated, Bidder shall be liable and hereby agrees to pay the Owner as liquidated damages and not as a penalty the sum of \$_____ dollars per calendar day for each and every day that the said work remains incomplete after the expiration of the substantial completion date and \$_____ dollars per calendar day for each and every day that the said work remains incomplete after the expiration of the Final completion date.

If the bid from the lowest responsible bidder exceeds available funds, the County may negotiate with the low bidder to obtain a contract price within available funds.

Va. Contractor No. _____/Class _____/Specialty_____/Dated_____

If determined to be the successful low bidder(s), and the project cost exceeds \$200,000, the above signed elects to utilize the escrow account procedure, a copy of which will be furnished with the contract.

Write "yes" or "No"
on above line

The County reserves the right not to withhold retainage.

In the event the successful bidder elects to use the escrow account procedure, the "Escrow Agreement" form shall be executed and submitted to the County of Chesterfield Purchasing Department within fifteen (15) calendar days after notification. If the "Escrow Agreement" form is not submitted within the fifteen-day period, the contractor shall forfeit his rights to the use of the escrow account procedure.

Award of this bid shall be based upon

CERTIFICATION OF NON-COLLUSION AND SIGNATURE SHEET
This sheet must be signed and submitted with bid in order for bid to be considered.

My signature below certifies:

- I agree to abide by all conditions of this Bid and that I am authorized to sign this Bid.
- The accompanying bid is not the result of or affected by, any act of collusion with another person or company engaged in the same line of business or commerce, or any act of fraud punishable under, Chapter 12, Title 18.2, 498.4 of the *Code of Virginia*, 1950, as amended. Furthermore, I understand that fraudulent and collusive bidding is a crime under the Virginia Governmental Frauds Act, the Virginia Government Bid Rigging Act, the Virginia Anti-Trust Act, and Federal Law and can result in fines, prison sentences, and civil damage awards.
- The accompanying bid is in compliance with the *State and Local Government Conflict of Interests Act* 2.2-3100, supplemented by Article 6, 2.2-4367-69 of the *Code of Virginia*. Specifically, no county employee, county employee's partner, or any member of the county employee's immediate family holds a position with the bidder, offeror, or contractor such as an officer, director, trustee, partner or the like, or is employed in a capacity involving personal and substantial participation in the procurement transaction, or owns or controls an interest of more than five per cent.

Complete Legal Name of Firm: _____

Check One: ☐ **Individual** ☐ **Partnership** ☐ **Corporation**

Order From Address: _____

Remit To Address: _____

Signature: _____

Name (type/print): _____ **Title:** _____

Fed ID No.: _____ **Phone (____)** _____ **Fax (____)** _____

We hereby provide the following information to Chesterfield County regarding our business. We understand that it is provided for statistical purposes only and all firms submitting bids will receive equal consideration.

Minority Business Enterprise: Yes _____ No _____

Woman-Owned Business: Yes _____ No _____

Chesterfield Business: Yes _____ No _____

TYPICAL BID FORM

(*Example Only* - Engineers shall prepare a standard bid proposal for each project using this typical bid form as a guideline.)

FOR WATER PROJECTS

CONTRACT NUMBER _____

Item No. and Estimated Quantity	Item	Unit Price	Item Amount
1. _____ L.F.	Clearing and Grubbing @ _____	\$ _____	\$ _____
2. _____ C.Y.	Rock Excavation @ <u>Sixty</u> and no/100 _____	\$ 60.00	\$ _____
3. _____ C.Y.	Hardpan Excavation @ <u>Twenty-Five</u> and no/100 _____	\$ 25.00	\$ _____
4. _____ C.Y.	Hand Excavation @ _____	\$ _____	\$ _____
5. _____ C.Y.	Removal of Unstable Soil and Replacement with Select Fill @ <u>Twelve</u> and no/100 _____	\$ 12.00	\$ _____
6. _____ M.B.F.	Sheeting and Shoring Ordered Left in Place @ <u>Seven Hundred & Fifty & no/100</u> _____	\$ 750.00	\$ _____
7. _____ L.F.	Furnish, Install, Excavate & Backfill _____ - Inch Water Main @ _____	\$ _____	\$ _____
8. _____ EA.	Furnish, Install, Excavate & Backfill _____ -Inch Water Main Fittings 45° Bend @ _____	\$ _____	\$ _____
_____ EA.	22½° Bend @ _____	\$ _____	\$ _____
_____ EA.	11¼° Bend @ _____	\$ _____	\$ _____
9. _____ EA.	_____ -Inch X _____ -Inch Tee @ _____	\$ _____	\$ _____
10. _____ EA.	Furnish, Install, Excavate & Backfill _____ -Inch Gate Valves @ _____	\$ _____	\$ _____

Item No. and Estimated Quantity	Item	Unit Price	Item Amount
11. _____ EA.	Furnish, Install, Excavate & Backfill Fire Hydrant Assembly including Fittings, Hydrants, Gate Valve, Valve Box & Blocking @ _____	\$ _____	\$ _____
12. _____ L.F.	Furnish, Install, Excavate & Backfill 6-Inch Water Main for Hydrant Connections @ _____	\$ _____	\$ _____
13. _____ EA.	Furnish, Install, Excavate & Backfill _____-Inch Air Release Valve Assembly with Necessary Mis- cellaneous Piping, Fittings, and valve (meter) box or manhole. @ _____	\$ _____	\$ _____
14. _____ EA.	Furnish, Install, Excavate & Backfill _____-Inch Blow-off or Flushing Hydrant, Valve Assembly including Fittings, Gate Valve Box and Pipe Cap. @ _____	\$ _____	\$ _____
15. _____ S.Y.	Replace Plant Mix Pavement (Overlay) @ _____	\$ _____	\$ _____
16. _____ L.F.	Place Base Asphalt in Trench @ _____	\$ _____	\$ _____
17. _____ L.F.	Replace Surface Treated Pavement @ _____	\$ _____	\$ _____
18. _____ L.F.	Asphalt Driveways @ _____	\$ _____	\$ _____
19. _____ L.F.	Stone for Driveways and Roadways @ _____	\$ _____	\$ _____
20. _____ L.F.	Concrete Driveways @ _____	\$ _____	\$ _____
21. _____ C.Y.	Concrete - Nonreinforced @ _____	\$ _____	\$ _____

Item No. and Estimated Quantity	Item	Unit Price	Item Amount
22. _____ C.Y.	Concrete - Reinforced @ _____	\$ _____	\$ _____
23. _____ L.F.	Seeding - Wooded Areas @ _____	\$ _____	\$ _____
24. _____ L.F.	Seeding - Lawn Kept Areas @ _____	\$ _____	\$ _____
25. _____ EA.	Straw Bales for Erosion Control, Staked. @ _____	\$ _____	\$ _____
26. _____ L.F.	Rip-Rap @ _____	\$ _____	\$ _____
27. _____ L.F.	Silt Fence @ _____	\$ _____	\$ _____
28. _____ L.F.	Tunneling and/or Boring (complete except for pipe) for ___-Inch Water Main @ _____	\$ _____	\$ _____
29. _____ Lump Sum	Mobilization Sum @ _____	\$(Lump Sum)	\$ _____
TOTAL (Items 1 - 29) =			\$ _____

NOTE: "If the bid from the lowest responsible bidder exceeds available funds, the County may negotiate with the low bidder to obtain a contract price within available funds."

TYPICAL BID FORM

(Example Only - Engineers shall prepare a standard bid proposal for each project using this typical bid form as a guideline.)

**FOR
SEWER PROJECTS**

CONTRACT NUMBER _____

Item No. and
Estimated
Quantity

Item

Unit Price

Item
Amount

1. _____ L.F.	Clearing and Grubbing @ _____	\$ _____	\$ _____
2. _____ C.Y.	Rock Excavation @ <u>Sixty and no/100</u>	\$ <u>60.00</u>	\$ _____
3. _____ C.Y.	Hardpan Excavation @ <u>Twenty-Five and no/100</u>	\$ <u>25.00</u>	\$ _____
4. _____ C.Y.	Hand Excavation @ _____	\$ _____	\$ _____
5. _____ C.Y.	Removal of Unstable Soil and Replacement with Select Fill @ <u>Twelve and no/100</u>	\$ <u>12.00</u>	\$ _____
6. _____ M.B.F.	Sheeting and Shoring Ordered Left in Place @ <u>Seven Hundred & Fifty & no/100</u>	\$ <u>750.00</u>	\$ _____
7. _____ L.F.	Furnish, Install, Excavate & Backfill 8-Inch Sanitary Sewer 0-6 Feet @ _____	\$ _____	\$ _____
_____ L.F.	6-8 Feet @ _____	\$ _____	\$ _____
_____ L.F.	8-10 Feet @ _____	\$ _____	\$ _____
_____ L.F.	10-12 Feet @ _____	\$ _____	\$ _____
_____ L.F.	Over 12 Feet @ _____	\$ _____	\$ _____

Item No. and Estimated Quantity	Item	Unit Price	Item Amount
8. ____ L.F.	Furnish, Install, Excavate & Backfill Line & Tee for 6-Inch House Connections with Plug @ _____	\$ _____	\$ _____
9. ____ V.F.	Furnish, Install, Excavate & Backfill 48-Inch Diameter Manholes (complete including casting) @ _____	\$ _____	\$ _____
10. ____ V.F.	Furnish, Install, Excavate & Backfill 60-Inch Diameter Manholes (complete including casting) @ _____	\$ _____	\$ _____
11. ____ L.F.	Replace Plant Mix Pavement (Overlay) @ _____	\$ _____	\$ _____
12. ____ L.F.	Place Base Asphalt in Trench @ _____	\$ _____	\$ _____
13. ____ L.F.	Replace Surface Treated Pavement @ _____	\$ _____	\$ _____
14. ____ L.F.	Stone for Driveways @ _____	\$ _____	\$ _____
15. ____ C.Y.	Concrete Encasement @ _____	\$ _____	\$ _____
16. ____ L.F.	Seeding - Wooded Areas @ _____	\$ _____	\$ _____
17. ____ L.F.	Seeding - Lawn Kept Areas @ _____	\$ _____	\$ _____
18. ____ EA.	Straw Bales for Erosion Control, Staked @ _____	\$ _____	\$ _____
19. ____ L.F.	Silt Fence @ _____	\$ _____	\$ _____

<u>Item No. and Estimated Quantity</u>	<u>Item</u>	<u>Unit Price</u>	<u>Item Amount</u>
20.	Tunneling and/or Boring (complete except for pipe) for _____-Inch Sewer Main		
_____ L.F.	@ _____	\$ _____	\$ _____
21.	Mobilization		
Lump Sum	@ _____	\$ <u>Lump Sum</u>	\$ _____
Total (Items 1 - 21)= _ \$ _____			

NOTE: "If the bid from the lowest responsible bidder exceeds available funds, the County may negotiate with the low bidder to obtain a contract price within available funds."

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____
_____ as Principal, and
_____ as Surety, are hereby
held and firmly bound unto _____ as owner in
the penal sum of _____ for payment of
which, well and truly to be made, we hereby jointly and severally bind
ourselves, successors and assigns. Signed, this _____ day of
_____, 20____. The Condition of the above
obligation is such that whereas the Principal has submitted to
_____ a certain BID, attached hereto
and hereby made a part hereof to enter into an Agreement in writing, for
the construction of _____

NOW, THEREFORE,

- (a) If said BID shall be rejected, or
- (b) If said BID shall be accepted and the Principal shall execute
and deliver an Agreement in the form attached hereto (properly
completed in accordance with said BID) and shall furnish a BOND
for his faithful performance of said Agreement, and for the
payment of all persons performing labor or furnishing materials
in connection therewith, and shall in all respects perform the
Agreement created by the acceptance of said BID, then this
obligation shall be void; otherwise, the same shall remain in
force and effect, it being expressly understood and agreed that
the liability of the Surety for any and all claims hereunder

Contract No. _____

shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____(L.S.)
Principal

Surety

By: _____

IMPORTANT - Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

Contract No. _____

GENERAL CONDITIONS

1. DEFINITIONS

A. AGREEMENT

The agreement covering the performance of the Work and the furnishing of the materials for the proposed construction. The terms "Agreement" and "Contract" are synonymous and include all Contract Documents as that term is defined in the General Conditions.

B. BID

The proposal submitted by a Bidder on the Bid Form consistent with the Instructions to Bidders, to complete the Work for a specified sum of money and within a specified period of time.

C. BIDDER

An individual, firm, partnership or corporation qualified in accordance with the Virginia Public Procurement Act, and approved by the Owner, that submits a Bid for the Work, either directly or through a duly authorized representative.

D. BID BOND

The bond, with corporate surety, supplied by a Bidder to the Owner on the Bid Bond form included in the Bid Documents, that guarantees the Bidder's compliance with the Instructions to Bidders. A certified check payable to the owner, delivered with the Bid, may also constitute a Bid Bond.

E. BID DOCUMENTS

All Contract Documents that the Owner or Engineer provides to potential Bidders before the time established for the submission of Bids.

F. CHANGE ORDER

An amendment or modification to the Agreement, properly executed by authorized representatives of the Owner and the Contractor on the form provided in the Contract Documents.

G. COMPLETION OF THE WORK

Substantial completion shall be defined as the event when the Work has progressed to the point where, in the opinion of the

Engineer, it is sufficiently complete, in accordance with the Contract Documents, so that the Work can be utilized for the purposes for which it is intended.

Final completion shall be defined as the event that occurs when (1) the Work has been completed, successfully tested and approved in accordance with the Contract Documents, (2) all submittals required by the Contract Documents (including Operation and Maintenance Manuals) have been made, (3) all Punch List items and restoration Work required by the Contract Documents has been completed; and (4) Work is complete and ready for final payment as evidenced by Engineer's written recommendation for final payment. The Contractor's use of water or wastewater lines for the purpose of completing the testing of equipment or piping, the tie-in of water or wastewater lines, or the continued use of equipment or piping because of tie-ins or testing shall not constitute Completion of the Work until all conditions of this definition have been satisfied.

H. CONTRACT BONDS

The Performance Bond and Labor and Material Payment Bond executed by the Contractor, with corporate surety, on the forms provided in the Contract Documents.

I. CONTRACT DOCUMENTS

The Advertisement, Instructions to Bidders, Bid Form, Bid Bond, Bond Requirements, Agreement, General Conditions, Supplemental General Conditions, Insurance Provisions (Including Instructions Regarding Insurance Certificates), Labor and Material Payment Bond, Performance Bond, Notice of Award, Notice to Proceed, Escrow Agreement (when used), Change Orders, Drawings, Specifications and Addenda, Special Provisions and any other document incorporated by reference into one of these documents.

J. CONTRACT PRICE

The amount of money which the Owner and the Contractor have agreed that the Owner will pay to the Contractor for performing and completing the Work.

K. CONTRACTOR

The party that has contracted to perform and complete the Work.

L. ENGINEER

The consulting engineer who has been designated by the County as engineer for the project, and the Engineer's authorized agents, inspectors or representatives.

M. FINAL ACCEPTANCE

The event that occurs when the Engineer issues to the County or the County issues to the Contractor a written statement that the Contractor has completely performed all Punch List items, has made all necessary submittals to the Owner and Engineer and has satisfied all of the Contractor's obligations under the Contract Documents.

N. FINAL INSPECTION

The inspection conducted by the Engineer to determine what items of the Work must be completed by the Contractor in order for Completion of the Work to occur. After the Final Inspection is conducted, the Engineer shall provide the Contractor with a Punch List that the Contractor must complete in order for Completion of the Work to occur. The Owner may perform the Final Inspection instead of, or together with, the Engineer.

O. FINAL PAYMENT

Payment by the Owner to the Contractor after Completion of the Work of retainage, and Force Account and Change Order items, if any, so that the Contractor has received all payments due him under the terms of the contract documents for performing and completing the Work.

P. FORCE ACCOUNT - EXTRA WORK

Work not within the Scope of Work as described in Paragraph 17 of the General Conditions that is determined to be necessary by the owner and Engineer.

Q. INSPECTOR

The person appointed by the Owner to carry out instructions given by the Owner and to inspect the Work performed and the materials supplied by the Contractor pursuant to this Agreement.

R. OWNER

Chesterfield County, Virginia, a political subdivision of the Commonwealth of Virginia, and its duly authorized officials, agents and employees.

S. PLANS

All drawings or reproductions of drawings that depict or relate to the Work. A pictorial representation of the Work or some portion of the Work, showing design, location and dimensions.

T. PUNCH LIST

The list provided to the Contractor by the Engineer or owner after Final Inspection that includes all items that the Contractor must complete in order for Completion of the Work to occur.

U. SPECIAL PROVISIONS

The Owner's list of Materials and Manufacturers Approved by the Department of Utilities and any Supplemental General Conditions included in the Contract Documents.

V. SPECIFICATIONS

The directions, provisions and requirements contained in the Contract Documents relating to the method or manner of performing the Work, or to the quantity or quality of materials to be furnished under the Contract Documents.

W. SUBCONTRACTOR

Any individual, firm or corporation having a direct contract with the Contractor for the performance of any part of the Work.

X. SUPERINTENDENT

The person appointed by the Contractor who is in direct charge of the Work for the Contractor.

Y. TIME OF COMPLETION

The time agreed upon by the Owner and the Contractor in the Agreement by which the Contractor is required to accomplish Completion of the Work, plus any extensions of time granted to the Contractor by the Owner pursuant to the Contract Documents.

Z. THE WORK

The whole and any part of the construction, labor, materials, equipment, incidentals or services necessary for the Contractor to achieve Completion of the Work as required by the Contract Documents.

2. AGREEMENT CONSTRUED UNDER VIRGINIA LAWS

The Agreement and Contract Bonds shall be executed in the State of Virginia and shall be construed in accordance with the laws of the State of Virginia. Any action at law, suit in equity or other adjudicatory proceeding instituted as a result of the performance, non-performance or alleged breach of this Agreement shall be brought in the Circuit Court of the County of Chesterfield, Virginia, to the express exclusion of any other judicial forum.

3. ASSIGNMENT OF AGREEMENT

Neither the Agreement, nor any part thereof, nor any monies due or that become due to the Contractor pursuant to the Agreement, may be assigned by Contractor without the prior written approval of the Owner.

4. SERVING OF NOTICE

When the owner is required by the Contract Documents to give written notice, demand or other communication to the Contractor, the Owner's notice, demand or communication shall be deemed to be given when it is deposited in the United States mail, postage pre-paid, and addressed to the address of the Contractor stated in the Agreement or at such other address as the Contractor designates in writing to the Owner.

5. LAWS AND REGULATIONS

The Contractor shall comply with all State and Federal laws, local ordinances, other regulations and orders or decrees of bodies or tribunals having jurisdiction over the Contractor or the Work and that affect the performance of the Work or the people who are employed or engaged in performing the Work.

The Contractor shall defend, indemnify and hold harmless the owner and its officers, agents and employees against any claim, liability or judgment arising from or based on the violation of such laws, ordinances, regulations, orders or decrees, whether the violation is committed by the Contractor or by its agents, employees, subcontractors or suppliers.

6. COMPLIANCE WITH SAFETY AND HEALTH LAWS

The Contractor shall comply with the Rules and Regulations Governing the Safety and Health of Employees Engaged in Construction and all revisions thereto, as adopted by the Safety and Health Codes Commission of the Commonwealth of Virginia and issued by the Virginia Department of Labor and Industry.

The Contractor shall perform all construction operations in accordance with all laws, rules and regulations of the U.S. Occupational Safety and Health Act of **1970**, the Standards of the U.S. Department of Labor, Occupational Safety and Health Administration and the latest amendments thereto.

7. JOB SAFETY

The Contractor is responsible for maintaining and implementing appropriate safety measures performing of the Work. The Engineer has not been retained to provide construction review services relating to the Contractor's safety precautions or to means, methods, techniques, sequences or procedures required for the Contractor to perform the Work.

8. SANITARY PROVISIONS

The Contractor shall provide and maintain in a neat and sanitary condition sufficient portable toilets and sanitary facilities for the use of its employees and the employees of subcontractors.

9. USE OF WATER

The Contractor shall not withdraw water from the Owner's facilities for any purpose unless suitable arrangements for withdrawal have been made with the Owner through the Inspector.

10. FIRE PREVENTION

The Contractor shall take all necessary precautions to prevent the outbreak of fire on the job site and to immediately suppress any fire which does occur.

11. CLEAN UP OF JOB SITE

The Contractor shall clean up the job site as the Work progresses. If the Contractor fails to keep the job site clean, the owner may require the Contractor to stop all or any portion of the Work until the job site is clean.

12. DESIGNATION OF WORK AREAS

The Owner reserves the right to designate the order in which the Contractor performs the Work.

13. PERMITS

The Owner shall obtain a permit from the County's Environmental Engineering Department for land disturbing activity and solid waste disposal. The Contractor shall be bound by the conditions contained in the land disturbance permit.

Except as otherwise provided in this paragraph, the Contractor must obtain all required licenses and permits and pay all charges and expenses for obtaining the permits. The Contractor shall determine what permits it must obtain to perform the Work.

14. PATENTS, FEES, ROYALTIES AND LICENSES

If the Contractor uses any device, material or process covered by trademark, patent or copyright, it shall obtain permission to use the device, material or process by executing a suitable legal agreement with the owner of the trademark, patent or copyright, and a copy of the agreement shall be filed with the owner before the Contractor uses the device, material or process.

The Contractor shall protect, indemnify and hold harmless the Owner and its officers, agents and employees from all claims or suits for infringement resulting from Contractor's use of any patented device, design, material or process or the Contractor's use of any trademark or copyright in connection with the Work. The Contractor shall protect, indemnify and hold harmless the Owner and its officers, agents and employees from any costs, expenses or damages, including reasonable attorney's fees which the Owner may suffer or incur at any time by reason of any alleged or actual patent, trademark or copyright infringement.

15. CONTRACT BONDS

Contract Bonds shall be executed on the form provided by the Owner in the Contract Documents and shall be in an amount not less than the full Contract amount, including any increases in the Contract amount that may be agreed upon between the owner and Contractor pursuant to the Contract Documents.

16. PRE-CONSTRUCTION CONFERENCE

Representatives of the Owner, the Engineer, and the Contractor shall meet and conduct a pre-construction conference at least three (3) days before the Contractor begins to perform the Work. A summary of the conference shall be prepared by the Engineer and distributed to the Owner and the Contractor. The Contractor shall acknowledge receipt of the Engineer's summary in writing to the Owner. Appendix A at the end of Part III of these specifications contains a list of issues generally discussed in the pre-construction conference.

17. SCOPE OF WORK

The Contractor shall perform in a workmanlike manner all work described in or reasonably implied by the Contract Documents; all additional or incidental work that is necessary to complete the Work to the finished lines and grades; and all Work necessary to connect the Work with adjoining work or facilities. The Contractor shall furnish all implements, machinery, equipment, tools, material, labor and construction expertise necessary to perform the Work.

18. FAMILIARITY WITH PROPOSED WORK

The Contractor has made a thorough examination of the Contract Documents and has fully informed itself of the quality of materials and character of the workmanship required to perform and complete the Work.

19. RESPONSIBILITY FOR ACTIONS OF WORKMEN

All employees of the Contractor and subcontractors are servants of the Contractor and subcontractors. They are not employees of the Owner. The Contractor shall not be relieved from responsibility or liability on account of any fault or delay in the execution of the Work, or any part thereof, resulting from the actions or inaction of any such employee or any material supplier.

20. INSPECTOR

The Inspector is authorized by the Owner to inspect and approve all Work and materials. In case of any dispute arising between the Contractor and the Inspector over materials furnished or the manner of performing the Work, the Inspector has the authority to reject material or suspend Work until the dispute is resolved by the Engineer. The Inspector is not authorized to revoke, alter, enlarge, relax or waive any requirements of the Contract Documents or to approve or accept any portion of the Work or issue instructions contrary to the Contract Documents.

The Engineer and Inspector shall have access at all times to all of the Work.

The Contractor shall have a level or transit and grade rod available on the job site and in good working condition at all times to assist the Inspector.

21. SUPERINTENDENT

The Contractor shall supervise the Work and shall be represented by a Superintendent who shall have full authority to act on behalf of the contractor as the Contractor's agent and representative. The Superintendent or Contractor shall be on duty at all times while the Work is being done.

22. MATERIALS AND WORKMANSHIP

The Contract Documents describe the character and features of the materials and workmanship required to perform the Work. The Contract Documents require first class work and materials in all particulars. In case of any disagreement between the Owner and the Contractor about the meaning and intent of the Contract Documents, the Engineer shall determine the meaning and intent, and the Engineer's determination shall be binding on the Contractor.

23. NO DEVIATION FROM CONTRACT DOCUMENTS BY THE CONTRACTOR

In performing the Work, the Contractor shall not deviate from the Contract Documents without the written consent of the Engineer and the Owner. If the Contractor does deviate from the Contract, it shall correct the deviation at its expense in a manner satisfactory to the Engineer and the Owner.

24. INTERPRETATION OF CONTRACT DOCUMENTS

In case of discrepancy between or among the Contract Documents, the Engineer shall make all interpretations that are necessary to fulfill the intent of the Contract Documents. The Engineer's interpretation shall be binding on the Contractor.

The Contractor shall verify all figures on the Plans and shall be responsible for the proper coordination of all dimensions as well as all different parts of the Work.

25. DISCREPANCIES

The Contractor shall immediately report to the Engineer, in writing, all discrepancies that it finds between the Contract Documents and site conditions and any inconsistencies or ambiguities in the

Contract Documents. The Engineer shall promptly correct such discrepancies, inconsistencies or ambiguities in writing. Work done by the Contractor after it discovers such discrepancies, inconsistencies or ambiguities shall be performed at the Contractor's risk.

26. CONFLICTS WITH LAWS, RULES OR REGULATIONS

If any requirement of the Contract Documents conflicts with the requirements of any governmental authority having jurisdiction over the project or the job site, then to the extent of such conflict, the Contract Documents shall be superseded by the applicable law, rule or regulation.

27. CONTRACTOR'S RESPONSIBILITY FOR THE WORK

The Contractor shall be responsible for the Work, and shall take all precautions to prevent injuries to persons and property on or about the Work. The Contractor shall bear all losses resulting from any difference in the amount or character of the Work from what the Contractor estimated or expected, or from any difference in the nature of the land in which or on which the Work is done from what the Contractor expected. The Contractor shall defend, indemnify and hold harmless, the Owner, its officers, and agents from all claims relating to labor and materials furnished for the Work; from all claims for violation of patents, trademarks and copyrights used in performing the Work; from injuries to any person performing the Work; from improper materials, implements or labor used; and from any act, omission or neglect of the Contractor, any subcontractor or their employees.

Until Final Acceptance of the Work, the Work shall be under the charge of the Contractor, and the Contractor shall take all necessary precautions against injury or damage to the Work or to any part of the Work from any cause whatsoever, whether arising from the execution or the non-execution of the Work.

The Contractor shall rebuild, repair, restore and make good, at his expense, all injuries or damage to the Work occasioned by any of the above causes before Final Acceptance of the Work.

28. CHARACTER OF WORKMEN AND EQUIPMENT

The Contractor and all subcontractors shall employ competent superintendents, foremen and workmen who shall perform the Work in a workmanlike manner. The Owner may demand that the Contractor

discharge or remove from the project any employee the Contractor or any subcontractor who is incompetent or negligent in the performance of his duties, or who refuses or neglects to comply with the directions of the Owner, Engineer or Contractor. Any person so discharged from the project shall not be employed again without written consent of the Owner.

29. INCREASED OR DECREASED WORK

The Owner may increase or decrease the value of the Work at any time, with or without the agreement of the Contractor. The Owner may increase or decrease the Work by adding, omitting or relocating sections, whether shown on the Plans or not.

If the increase, decrease, or relocation of the Work is substantially the same in nature as the remainder of the Work, then the Contract Price shall be adjusted based on the unit prices contained in the Contract Documents. Whenever additional work involves a substantial change in the nature of the design of the Work or in the type of construction, the additional Work shall be performed in accordance with the specifications and as directed by the Engineer, provided, however, that before the Contractor begins to perform the additional Work, a Change Order shall be executed by the parties.

30. WORK IN BAD WEATHER

No Work shall be performed during stormy or inclement weather unless it can be performed in a satisfactory and workmanlike manner.

31. WORK OUTSIDE OF NORMAL WORKING HOURS

Normal working hours for the project are 8:00 A.M. to 4:30 P.M., Monday through Friday. If the Contractor desires to perform work outside of the normal working hours, it shall request the Owner's permission at least 48 hours in advance of the time when the Contractor proposes to perform the Work. The Owner may refuse the Contractor permission to work outside of normal working hours for any reason, including but not limited to the owner's difficulty in making arrangements for proper inspection of the Work. The Contractor shall avoid making undue noise when working outside of normal working hours. Under normal circumstances the Contractor will not be permitted to work on Sundays or on holidays without written approval from the Owner.

The contractor may request, in writing, different normal working hours than those stated above. The revised work hours must be agreed upon by the Inspector and approved by the Owner in writing. Work in excess of 40 hours per week shall be considered overtime work.

The Owner reserves the right to require the Contractor to work outside of normal working hours in the interest of public safety or convenience. No claim for additional compensation shall be made by the Contractor when such occasions occur.

Except for Work that is scheduled outside of normal working hours by the Owner in order to promote public safety or convenience, the Contractor will be liable for the expense of overtime work of the Owner's employees required by reason of the Contractor performing work outside normal working hours.

32. CHANGE OF PLANS

The Engineer, with the approval of the Owner, may make alterations for line, grade, plan positions, dimensions, materials or any other part of the Work, either before or after commencement of the Work.

33. CORRECTION OF WORK

The Contractor shall promptly remove from the premises all work rejected by the Engineer or Inspector for failure to comply with the Contract Documents, whether the rejected work is incorporated into the Work or not. After removing the rejected work, the Contractor shall promptly replace and re-execute the work in accordance with the Contract Documents, without expense to the Owner. The Contractor shall repair, at its own expense, all work of other contractors that is destroyed or damaged by the Contractor or any subcontractor.

All removal and replacement work shall be performed at the Contractor's expense. If the Contractor does not remove rejected work within ten (10) calendar days after it receives written notice from the Owner or Engineer to remove it, the Owner may remove the rejected work, and store the materials, at the expense of the Contractor.

34. EXISTING STRUCTURES

The location of existing sewers, water and gas pipes, conduits and other structures across, along or under the area of the Work are not necessarily shown on the Contract Documents, and if shown, the description, composition, location, depth and dimensions of those structures may not be correct. The Owner shall not be responsible to the Contractor for any delays or extra costs incurred by the Contractor as a result of any discrepancy between the actual location of existing structures and the Contract Documents or as built drawings. The Contractor shall have a working pipe locator on the job at all times.

The Contractor shall dig such test holes as are needed to locate existing underground structures. The contractor shall dig such test holes only after giving 48 hours prior notice to the Owner and to the owner of the underground structure.

35. CARE FOR EXISTING STRUCTURES

The Contractor shall be liable for all damage to any existing structure or property arising from its negligence or carelessness. The Contractor shall protect and maintain all underground, overhead or surface utilities encountered while performing the Work. The Contractor shall locate and adjust water valve boxes on existing water lines in order to facilitate turning water off so that appropriate tie-ins can be made.

Forty-eight (48) hours prior to commencing work, the Contractor shall contact the Utility Information Center ("Miss Utility"), telephone number 1-800-552-7001, for assistance in locating existing underground utilities.

The Contractor shall not kill, deface or cut down trees unnecessarily, both within and outside of project work areas or easements.

The Contractor shall be responsible for all damage to property not in the Work area or easements.

36. SUBSURFACE CONDITIONS

The Contractor shall promptly, and except in an emergency, before such conditions are disturbed, notify the owner in writing of subsurface or latent physical conditions at the site differing materially from those indicated in the Contract Documents; or of physical conditions at the site, either unknown or differing from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents.

37. INDEPENDENT TESTING

The Owner may employ an independent testing laboratory to conduct tests of materials, supplies, machinery, tools, or other equipment supplied by the Contractor when the Owner believes it to be necessary to assure compliance with the Contract Documents. The Contractor shall cooperate with the Owner in facilitating these tests.

38. EXTRA WORK - FORCE ACCOUNT

Any work that is necessary for Completion of the Work that is not described in the Scope of Work (Paragraph 17 of the General Conditions) is Extra Work and shall be paid for in one of the following manners:

- A. At a price agreed upon in writing between the Contractor and Owner.
- B. In the event of work covered by unit prices, at a price derived from application of unit prices to the quantities necessary to complete the extra work.
- C. In the event of work not covered by unit prices, at actual cost plus fifteen percent (15%). If the Extra Work is performed by a previously approved subcontractor, then at actual cost plus fifteen percent (15%) for the subcontractor, and five percent (5%) for the Contractor. Actual cost shall include only the necessary labor (including workmen's compensation, insurance, premiums and payroll taxes), equipment rental (including fuel and lubrication for equipment used in performing the Extra Work), and materials. Equipment rental cost shall be the amount actually paid by the Contractor for rental of the equipment, pro-rated rental rate for the time the equipment was used to perform the Extra Work, or the pro-rated rental rate for the equipment as shown in the latest rate schedule compiled by the Associated Equipment Dealers, whichever is lower. The Engineer shall determine the Contractor's actual cost for performing Extra Work, and the Engineer's determination shall be binding on the Contractor. Under no circumstances shall the Contractor be entitled to any sum of money for performing Extra Work, or for any delays that the Contractor alleges it suffered as a result of performing Extra Work, above actual cost plus 15% (or 15% and 5% when applicable) as outlined above.

Change Orders shall be agreed upon prior to beginning Extra Work. No Change Order shall in any manner or to any extent relieve the Contractor or his Surety of any obligation under the contract. All Change Orders given in accordance with the Agreement are a part of the Agreement and are subject to each and every term or requirement of the Agreement.

The Contractor is responsible for all damages caused by the carelessness or lack of skill of the Contractor, the subcontractors, or employees of the Contractor or subcontractor in doing Extra Work.

39. PROGRESS OF THE WORK

The Contractor shall provide an adequate force of labor and equipment to prosecute the Work to insure the Completion of the Work within the time limit for Completion as set forth in the Agreement.

If required by Owner or Engineer, the Contractor shall furnish a progress schedule to the Owner and Engineer in a form acceptable to the Engineer within ten (10) calendar days after the request is made. The Contractor shall provide all manpower and equipment necessary to meet the progress schedule. In the event periodic estimates indicate that the schedule progress is not being met, the Owner or Engineer may require the Contractor to furnish in writing to the Engineer the method the Contractor proposes to employ to bring the project into compliance with the progress schedule. The Owner may withhold payments if the Work is behind the progress schedule or otherwise not being performed in accordance with the terms of the Contract Documents.

40. TIME OF COMPLETION

Time is of the essence in performing this Contract. The Contractor shall perform and complete the Work in accordance with the Contract Documents before the expiration of the time limit stipulated in the Bid, the Agreement and any extensions of time that are agreed upon pursuant to the procedure for granting extensions of time set forth in the Contract Documents. The amount of time permitted for Completion of the Work contemplates ordinary delays to construction work of a similar character. The Contractor shall not be entitled to an extension of time or additional compensation for ordinary delays in the Completion of the Work or for delays occasioned by inclement weather or accidents. Such delays will not relieve the Contractor from maintaining the rate of progress specified herein or from completing the Work within the stipulated time limit.

If delays are caused by acts of God, acts of government, unavoidable strikes, Extra Work, or other causes or contingencies not enumerated in the preceding paragraph and if they are beyond the control or responsibility of the Contractor, the Contractor may request the Owner to allow additional time to perform and complete the Work. If the Owner determines that the delay is properly excusable, the Owner will, in writing, extend the time for completion of the Work by the amount of time that the Owner believes to be appropriate. The Contractor agrees that such extension of time shall constitute his sole remedy against the Owner for such delays. Contractor shall not

have or assert any claim for, nor shall he be entitled to any additional compensation or damages on account of such delays. If the delay is due solely to the negligence of the Owner, or any of its officers or employees, the Contractor may also request from the Owner an adjustment in the Contract Price for actual costs incurred by the Contractor to perform and complete the Work. The Contractor shall be entitled to an adjustment in Contract Price only for actual costs, as that term is defined in Paragraph 38, in the General Conditions, entitled Extra Work-Force Account. If the owner determines that the delay is of the nature described in this subparagraph and that an adjustment in price is warranted, the owner may, in writing, grant an adjustment in the price for the Work in amount deemed appropriate by the Owner.

Within ten (10) calendar days from the beginning of any delay for which Contractor is entitled to an extension of time or additional compensation, the Contractor shall submit in writing to the Owner, with a copy to the Engineer, its request for adjustment in price or extension of time for the completion of the Work. Any such request shall set forth the cause and particulars of the delay, the details of the delay, and documentation supporting the extension or adjustment requested. The Owner shall review the information and documentation submitted by the Contractor and shall respond to the Contractor

in writing. If the Contractor fails to comply with any requirement of this subparagraph the Contractor shall be precluded from making any claim for an adjustment in the Contract Price or extension of time for Completion of Work due to the delay. In no event shall the Owner's officers, agents or employees have any liability to the Contractor, any subcontractors, or any agents, servants or employees of the Contractor or sub-contractors with respect to or arising out of any actual or alleged delay in the Contractor's performance.

The Owner may delay the beginning of the Work or any part thereof because it has not obtained a necessary property interest in the land on which the Work or some portion of the Work, is to be performed. The Contractor shall have no claim for additional compensation or damages on account of such delay, but shall be entitled to request an extension of time as herein provided.

41. TERMINATION FOR BREACH OF NON-PERFORMANCE

If the Contractor fails to perform the Work promptly and diligently, or if the Contractor breaches the Agreement in any other way, the Owner may:

- A.** After providing the Contractor with fifteen (15) days written notice, supply any workmen, equipment or materials necessary to

ensure that the work is performed promptly and diligently. The Owner may deduct the cost of supplying additional workmen, equipment or materials from payments due to the Contractor;

- B. Terminate the Agreement, enter upon the premises, take possession of all equipment, materials or appurtenances, and employ any person or persons to finish the Work.

In case of termination of the Agreement by the Owner pursuant to this paragraph, the Contractor shall not be entitled to receive any further payment from the Owner until Completion of the Work has occurred. After completion of the Work, the Owner shall pay to the Contractor the amount of the unpaid balance due to the Contractor at the time the Agreement was terminated minus the cost incurred by the Owner to complete the Work. If the cost incurred by the Owner to complete the Work exceeds the unpaid balance due to the Contractor, the Contractor shall be due no money from the Owner and, instead, the Contractor shall pay to the Owner the difference between the unpaid balance due and the Owner's cost to complete the Work.

The cost incurred by the Owner to complete the Work shall be audited by the Engineer. The Engineer's certification of the Owner's cost shall be binding upon the Contractor.

42. WAIVER OF ONE BREACH NOT WAIVER OF OTHERS

No waiver by the Owner or its agents or employees of any breach of this Agreement by the Contractor shall be construed as a waiver of any other or subsequent breach of the Agreement by the Contractor. All remedies provided by this Agreement are cumulative, and in addition to each and every other remedy under the law.

43. LIQUIDATED DAMAGES

The rate of progress, and the time for completion of the Work are essential conditions of the Agreement. The Work shall be prosecuted regularly, diligently and without interruption at a rate that will ensure Completion of the Work in the time specified in the Contract Documents.

Time is of the essence of this Agreement.

If the Contractor fails to accomplish Substantial Completion of the Work in accordance with the Contract Documents within the time stated in the Agreement or in any progress schedule or within any time as extended in writing by the Owner, the Contractor shall pay to the Owner the sum of \$_____ for each and every calendar day after the date agreed upon by the parties for Substantial Completion has passed until Substantial Completion of the Work is accomplished.

If the Contractor fails to accomplish Final Completion of the Work in accordance with the Contract Documents within the time stated in the Agreement or in any progress schedule or within any time as extended in writing by the Owner, the Contractor shall pay to the Owner the sum of \$_____ for each and every calendar day after the date agreed upon by the parties for Final Completion has passed until Final Completion of the Work is accomplished.

The above sums are agreed upon by the parties as the liquidated damages, and not a penalty, that the Owner will suffer by reason of the delay by the Contractor in accomplishing Completion of the Work, resulting in the inability of the Owner to use the improvements at the time agreed upon the parties for Completion. The Owner may deduct and retain liquidated damages out of any monies which may be due, or become due, to the Contractor.

44. SHOP DRAWINGS

Contractor shall submit to the Engineer for its approval detailed Shop or Working Drawings ("Shop Drawings") when required to do so by the Engineer for the construction of any part of the Work. Any work done or materials ordered by the Contractor before the Engineer has approved the Shop Drawings relating to the Work or material shall be at the risk of the Contractor.

The Contractor shall bear the cost of preparing all Shop Drawings and blueprints. The Contractor shall supply three (3) copies of all Shop Drawings and blueprints to the Engineer.

All certifications, Shop Drawings and Working Drawings shall include for each product, the manufacturer's name, the type of product, the location of the manufacturer's plant, and the project name and number.

The Contractor shall furnish the Engineer with all blue prints, copies of Shop Drawings and material certifications that are required by the Engineer for approval. Upon Completion of the Work, the Contractor shall submit the original tracings to the Engineer, if the Engineer so requires.

The purpose of Shop Drawings is to demonstrate to the Engineer that the Contractor understands the design concept of the Work by indicating which equipment and material it intends to furnish and install and by detailing the fabrication and installation methods it intends to use. The Engineer's approval of Shop Drawings relates to the general concept and not the detail of the Work, and the Engineer's approval will not relieve the Contractor from responsibility for errors or omissions in dimensions or quantities. Approved Shop Drawings are not Change Orders.

The Contractor shall also submit to the Engineer and Inspector Shop Drawings for operation manuals for machinery and equipment installed by the Contractor in Pump Stations, Tanks, Pressure Reducing Vaults, Treatment Plants and when otherwise required by the Engineer. These Shop Drawings shall be provided to the Engineer at the earliest possible time and in no case less than 48 hours before the Contractor begins to perform the Work, in order to avoid any unnecessary delays in beginning the Work.

If approved Shop Drawings deviate from or conflict with the Contract Documents, the Contractor shall comply with the Contract Documents.

45. CUT SHEETS

When required by the Owner, the Contractor shall submit three copies of construction "cut-sheets" to the Owner's Department of Utilities prior to beginning the Work. "Cut-sheets" shall show the centerline, the offset hub elevations and the amount of cut to be made by the Contractor before it installs the improvements. Cut sheets are required on all gravity and force main wastewater projects, on water line projects where the final grade on future roads and paved areas cannot be determined, and on projects where lines are installed in easements. Cut sheets shall be prepared by a qualified engineer or surveyor. Cut sheets shall contain the following information:

- A. Temporary bench marks at each manhole.
- B. The location of each downgrade manhole, beginning with station 0+00 and identifying adequately the station of each service connection.
- C. Elevations of centerline cuts every 25 feet when the Owner is paying all or some portion of the cost of the project.
- D. Centerline elevations every 50 feet and at every valve box and manhole location for water line projects and for force main projects.

46. FINAL INSPECTION

Before Final Inspection of the Work, the Contractor shall clean up the site of the Work including all rights-of-way, and shall leave the site in a clean, neat and sanitary condition. Contractor shall remove all machinery, tools, surplus material, temporary buildings, and other structures from the site of the Work.

When the Work is complete and the area cleaned up, the Contractor shall request a Final Inspection of the Work by the Engineer and Owner. After the Final Inspection, the Engineer shall prepare a Punch List. After the Contractor has completed all Work on the Punch List, and the project is ready for Final Acceptance by the Owner, the Contractor shall request in writing an inspection for Final Acceptance of the Work by the Engineer and Owner.

47. USE OF WORK

Whenever in the opinion of the Engineer or Inspector any portion of the Work is completed or in acceptable condition for use, it may be used by the Owner for the purpose intended. However, such use by the Owner does not constitute acceptance of any portion of the Work, or a waiver of any of the provisions of the Contract Documents.

48. PAYMENT

If the Contractor performs properly all of the obligations of the Contract Documents, the owner shall pay the Contractor for the performance of the Work in the manner and within the time specified in the Contract Documents. The Owner also agrees to pay the Contractor for Extra Work in accordance with the terms of the Contract Documents. The Contractor shall make requests for payment by submitting the original and four (4) copies of the monthly estimate for partial payment to the Owner on a form acceptable to the Owner, as set forth in Paragraph 50 of the General Conditions, entitled Monthly Estimates.

49. SALES AND USE TAXES

The Owner shall make no payment to the Contractor for sales or use tax that is not included in the Contract Price at the time the Agreement is executed by the Owner.

50. MONTHLY ESTIMATES AND RETAINAGE

On the 20th day of each month or at any other regular time agreed upon by the Owner and Contractor, the Contractor and the Inspector shall prepare and submit to the Owner a monthly estimate for Partial Payment. The monthly estimate shall cover items of work for which the Contractor is entitled to be paid since the last previous monthly estimate was submitted, including (1) the value of the Work done, (2) major items of equipment or materials delivered to the site of the project to be installed by the Contractor, as substantiated by submitted invoices and as approved by the inspector, and (3) materials incorporated into the Work.

The Owner shall pay to the Contractor all sums due under the monthly estimate less five percent (5%) retainage within 30 days after of the approved monthly estimate by the owner, unless the Owner asserts a right to withhold some or all of the payment under the provisions of the Contract Documents.

The Contractor will be paid for materials delivered to and stored on the job site. Payment will be for actual cost of materials as evidenced by receipted invoices, less five percent (5%) retainage. The Contractor shall make a separate accounting of these materials and shall submit an accounting of them, with four (4) copies, along with the monthly estimate for partial payment.

51. PARTIAL PAYMENT NO WAIVER OF RIGHTS

Partial payments made under this Agreement by the Owner are not evidence of the proper performance of the Agreement by the Contractor either in whole or in part, and no payment made by the Owner shall be construed to be an acceptance of defective or improper work. No act of the Owner or the Engineer, or the representative of either of them, in superintending or directing the Work, no failure to disapprove or reject any material used in the Work, and no extension of time for the Completion of the Work shall be construed as acceptance of the Work either in whole or in part. Acceptance of the Work by the Owner shall occur only upon Final Payment by the Owner.

Before Final Payment is made, the Contractor shall sign and attest to a statement accepting the Final Payment in full satisfaction and settlement of all claims on account of the Work done and materials furnished under the Agreement, and certifying that all claims of others against the Contractor for material provided or labor performed have been paid and satisfied in full.

52. FINAL PAYMENT

After receiving satisfactory evidence from the Contractor that all labor and material bills have been paid and as soon as practicable after the completion of the Work, the Inspector shall prepare a final estimate of the amount of the Work, and the value thereof, and the Owner shall, within 30 days after such final estimate is made, pay to the Contractor the entire sum due after deducting therefrom all previous payments, and all deductions to be retained by the Owner under any of the provisions of the Contract Documents. All prior estimates and payments shall be subject to correction in the final estimate of payment.

53. STANDARDS FOR COMPUTING PAY ITEMS

- A. **ROCK AND HARDPAN** - The depth of main line trenches, service trenches and force main trenches shall be computed using the actual depth of the rock to the invert of the pipe plus six inches (6"); and the actual length plus a width of thirty-six inches (36") for pipe twelve inches (12") and less in nominal diameter. For pipe between twelve inches (12") in nominal diameter and 36" in nominal diameter, the trench width shall be the outside diameter of the pipe barrel plus twenty-four inches (24") and trench depth shall be based on the depth of rock to the outside barrel of the pipe plus six inches (6").

For pipe thirty-six inches (36") or greater in nominal diameter, the trench width shall be the outside diameter plus thirty-six inches (36") and trench depth shall be the depth of rock to the outside barrel of the pipe plus six inches (6") . Manhole and structure excavation, including the base, shall be at the depth encountered, plus six inches (6"). The horizontal dimensions shall assume a square extending one foot beyond the exterior walls of the structure when forming is not required and two feet when forming is required. No additional payment for rock excavation in trench will be allowed for this assumption.

- B. **EARTH** - When payment is to be computed on a volumetric basis, the width and depth of main line trenches, force main trenches and service trenches shall be computed in the same manner as for Rock and Hardpan except that the depth shall be the bottom of the pipe for force mains, and the invert of the pipe for gravity lines. When excavation payments are computed based on depth or on cut increments, measurements shall be from the ground surface of the center line of the trench to the invert of the pipe line.
- C. **BEDDING IN ROCK, HARDPAN OR EARTH** - The cost of bedding that is required for pipe that is laid in rock or hardpan or earth shall be included in the unit price for these items and no extra compensation shall be allowed.
- D. **CLEARING AND GRUBBING** - The cost of clearing and grubbing shall include removal of all trees, stumps and other vegetation. No extra compensation shall be allowed for removing or disposing of trees, stumps and other vegetation.
- E. **FURNISH, INSTALL, EXCAVATE AND BACKFILL FOR (EACH SIZE) PIPE OR APPURTENANCE** - Price per linear foot of water and/or sewer line and price per each appurtenance for material as specified shall include furnishing, installing, excavating, backfilling, and testing the pipe and appurtenance at the depth indicated and no extra compensation shall be allowed for any of these items.

Bedding that is required for pipe and appurtenances shall be included in price per linear foot or per each appurtenance where applicable for excavation and backfill and no extra compensation shall be allowed. Depth for payment shall be measured to the invert of the pipe.

- F. FURNISH, INSTALL, EXCAVATE AND BACKFILL FOR SEWER SERVICE CONNECTION** -Price per linear foot of service connection pipe installed shall include an approved plug and marker at the upper end of the service line. The pay length of the connection shall be the horizontal distance from the center line of the main sewer to the upper end of service line. Price per service tee shall be as installed, complete in place. No extra compensation shall be allowed for any of these items.
- G. HAND EXCAVATION** - Price per cubic yard for hand excavation shall be allowed only when specifically authorized, in writing, by the Engineer. Hand excavation shall be classified as excavation with hand tools rather than with excavating machines. Hand excavation will be permitted only when the Engineer believes that it is necessary and will normally be limited to the amount required to protect trees, utility poles or structures that would otherwise be removed during the course of machine excavation. No allowance shall be made for hand excavation performed to locate or protect culverts and underground utilities.
- H. REMOVAL OF UNSTABLE SOIL AND REPLACEMENT WITH SELECT MATERIAL -** Price per cubic yard of select material shall be allowed only when the Engineer directs, in writing, that select material shall be provided. The price for providing select material shall include the cost of removing unsuitable material and replacing it with select material in order to allow for a stable foundation below the pipe line and for the cost of providing select material because the excavated material is unsuitable for proper backfilling of the trench. The cost of transporting surplus excavation from other portions of the project will be compensated only when the haul distance exceeds one thousand feet. Payment for the cost of select material required when pipe is laid in rock or hardpan and for backfill because of the inability to use rock or hardpan from the trench shall be included in the price bid to Furnish, Install, Excavate and Backfill (Each Size) Pipe. No extra compensation shall be allowed for Removal of Unstable Soil and Replacement with Select Material.
- I. STANDARD MANHOLES** - Price shall be determined per vertical foot of standard manhole. The depth shall be the actual depth to the invert of the utility line plus 8" concrete base. No extra payment shall be allowed for bedding when rock excavation is encountered. Price shall include steps, frame and covers.

- J. WATERTIGHT MANHOLES** - Price shall be determined per vertical foot of watertight manhole. The depth shall be the actual depth to the invert of the sewer line plus 8" concrete base. No extra payment shall be allowed for bedding when rock excavation is encountered. Price shall include steps, frame and watertight covers.
- K. DROP CONNECTIONS** - Price shall be determined per vertical foot for each drop connection constructed. The depth shall be the dimension shown in Standard Details.
- L. SEEDING -**
- 1) WOODED AREAS** - Price shall be determined per linear foot of easement including furnishing and spreading seed as required by the specifications.
 - 2) LAWN KEPT AREAS** - Price shall be determined per linear foot of easement including topsoil, seeding, mulch, fertilizer, lime, etc.
- M. STRAW BALES FOR EROSION CONTROL** - Price shall be determined per bale for furnishing, installing and maintaining.
- N. SHEETING AND SHORING ORDERED LEFT IN PLACE** - Price shall be determined per one thousand board feet for furnishing and installing sheeting and shoring ordered left in place, including cutting and bracing. The Contractor shall not be compensated for the cost of placing and removing sheeting or bracing not ordered left in place.
- O. MANHOLE AIR VENT** - Price for each ductile iron manhole air vent shall include pipe, fittings, connection to manhole, excavation and backfill and all necessary appurtenances.
- P. CLASS "B" CONCRETE** - Price shall be determined per cubic yard of concrete used to perform the Work. Price shall include all required excavation, forming and finishing.
- Q. STONE FOR ROAD SHOULDERS** - Price shall be determined per linear foot of pipe line trench, surfaced with approved crusher run stone. Stone shall be placed to a depth of 4 inches, or the same depth as existed prior to construction, whichever is greater.
- R. ASPHALT OVERLAY** - Price shall be determined per square yard for placing asphalt over entire roadway per VDOT standards.
- S. PLACING ASPHALT IN TRENCH** - Price shall be determined per linear foot of pipe line trench for replacement of base material.

- T. **RIP RAP** - Price shall be determined per linear foot as measured along center line of the stream that is crossed. Price shall include furnishing and installing rip rap as required by the Contract Documents.
- U. **LOCATE AND MAKE CONNECTION TO EXISTING MANHOLE** - Lump Sum Price shall include all work necessary for making connection to existing manhole and establishing a new flow channel.
- V. **LOCATE AND MAKE CONNECTION TO EXISTING LINE** - Lump Sum Price shall include all work necessary for making connection to existing water lines; including fittings and removing abandoned pipe; and for sewer projects, establishing a new flow channel, etc.
- W. **CASING PIPE - BORE OR TUNNEL** - Price shall be determined per linear foot for furnishing and installing casing pipe by boring or tunnelling, threading carrier pipe, blocking, sealing ends, pits and all other work that is required to complete the installation.
- X. **CASING PIPE - OPEN TRENCH** - Price shall be determined per linear foot for furnishing and installing casing pipe in an open trench, threading carrier pipe, blocking, sealing ends, pits and all other work that is required to complete the installation. Price shall include excavation and backfill.
- Y. **MOBILIZATION** - Lump sum price shall include all work necessary to mobilize, demobilize and remobilize as necessary to perform work in accordance with the project plans and specifications.

54. RIGHT TO AUDIT PROVISION

Contractor's records, which shall include but not be limited to accounting records, written policies and procedures, subcontract files (including proposals of successful and unsuccessful bidders), original estimates, estimating worksheets, correspondence, change order files (including documentation covering negotiated settlements), and any other supporting evidence necessary to substantiate charges related to the Agreement (all the foregoing hereinafter referred to as "records") shall be open to inspection and subject to audit and/or reproduction, during normal working hours, by Owner's agent or its authorized representative to the extent necessary to adequately permit evaluation and verification of any invoices, payments or claims submitted by the Contractor or any of his payees pursuant to the Contract Documents. The records subject to examination shall also include, but not be limited to, those records necessary to evaluate and verify direct and indirect costs (including overhead allocations) as they may apply to costs associated with the Agreement.

For the purpose of such audits, inspections, examinations and evaluations, the Owner's agent or authorized representative shall have access to the records from the effective date of the Agreement, for the duration of the Work, and until two (2) years after the date of Final Payment by Owner to Contractor pursuant to the Contract Documents.

Owner's agent or its authorized representative shall have access to the Contractor's facilities, shall have access to all necessary records, and shall be provided adequate and appropriate work space, in order to conduct audits in compliance with this article. Owner's agent or its authorized representative shall give Contractor reasonable advance notice of intended audits.

Contractor shall require all subcontractors, insurance agents, and materials suppliers (collectively referred to as "payees") to comply with the provisions of this article by insertion of the requirements hereof in a written contract agreement between Contractor and payee. Failure to obtain such written contracts which include such provisions shall be reason to exclude some or all of the related payees' costs from amounts payable to the Contractor pursuant to the Agreement.

If an audit inspection or examination performed pursuant to this paragraph, discloses overcharges of any nature by the Contractor to the Owner in excess of five percent (5%) of the total billings made by the Contractors pursuant to the Contract Documents, the actual cost of the Owner's audit shall be paid by the Contractor.

55. WARRANTY PERIOD

The Contractor guarantees the quality and workmanship of the Work beginning on the date of Final Acceptance. The Warranty Period shall be one year, except that the Warranty Period for road work shall be three years or the period established by the Virginia Department of Transportation's latest requirements, whichever is longer.

56. NOTIFICATION TO PROPERTY OWNERS

Contractor shall properly notify all property owners two (2) weeks prior to the start of any construction (including land clearing). Notification shall be in the form of a letter similar to the "sample" reflected in the County's latest Water and Sewer Specifications. (See sample "NOTIFICATION" letter - Page NOT-1).

57. DRUG FREE WORKPLACE

During the performance of this contract, the contractor agrees to:

- A. Provide a drug-free workplace for the contractor's employees
- B. Post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition.
- C. State in all solicitations or advertisements for employees placed by or on behalf of the contractor that the contractor maintains a drug-free workplace.
- D. Include the provisions of the foregoing clauses in every subcontract or purchase order over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.

For the purposes of this section, "drug-free workplace" means as site for the performance of work done in connection with a specific contract awarded to a contractor in accordance with this chapter, the employees of whom are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession or use of any controlled substance or marijuana during the performance of the contract.

58. AWARD NOTIFICATION

For information pertaining to the award of this procurement transaction, bidders may access public notification electronically at www.chesterfield.gov/ManagementServices/Purchasing/purchase.asp

59. UNBALANCED BIDS

The County reserves the right to negotiate unbalanced unit prices with the lowest bidder prior to award and to award to the next low bidder if a reasonable fee is not achieved.

60. ENVIRONMENTAL MANAGEMENT

Contractor shall be responsible for complying with all applicable federal, state, and local environmental regulations, if any. Additionally, the Contractor must meet all Chesterfield County Environmental Management System (EMS) requirements. For questions or additional information, contact the Office of Environmental Management at (804)717-6531.

61. FAITH-BASED ORGANIZATIONS

Chesterfield County does not discriminate against faith-based organizations in accordance with the Code of Virginia, Section 2.2-4343.1.

62. WATER LINE TIE-INS

All water line tie-ins to the existing distribution system including vertical and horizontal relocations shall be coordinated with the Operations and Maintenance Section of the Utilities Department. Tie-ins shall be scheduled Monday thru Thursday from 9:00 a.m. to 4:00 p.m. Tie-ins may be required outside of this time and/or during nighttime hours.

The County reserves the right to require the Contractor to perform tie-ins outside of the normal working hours detailed above in the interest of public safety or customer service. No claim for additional compensation shall be made by the Contractor when such occasions occur.

Proper preparation including field verification of the plans shall be accomplished to minimize shutdown time and prevent the tie-in from exceeding scheduled shutdown time. Sufficient personnel, equipment and materials shall be on site prior to the water being shut off. Where applicable, excavation and preassembling of fittings shall be performed. If, in the opinion of the inspector, sufficient resources are not available, the tie-in will be cancelled and rescheduled.

Tie-ins to asbestos cement pipe shall be made to rough barrel pipe. Tie-ins to the machined section of asbestos pipe will not be permitted. Where asbestos cement pipe couplings have been removed, the machined end of the pipe shall be removed. Abandonment of cement asbestos pipe shall be per state and federal requirements.

Tie-ins involving fittings shall include provisions for temporary blocking until concrete blocking has cured.

All pipe and fittings used for a tie-in are to be swabbed with a 1% chlorine solution prior to connection.

63. PROCEDURES FOR CLAIMS AND DISPUTES

A claim is a demand or assertion by the Contractor seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of time or other relief with respect to the terms of the Contract. Claims must be initiated by written notice. The responsibility to substantiate claims shall rest with the Contractor.

Claims by the Contractor must be initiated within 21 days after occurrence of the event giving rise to such claim or within 21 days after the claimant first recognizes the condition giving rise to the claim, whichever is later. Claims must be initiated by written note to the Architect or Engineer and Owner. Submittal of a claim by the Contractor within the time limits prescribed by this paragraph shall be required as a condition precedent to the institution of litigation by the Contractor with respect to the subject matter of that claim.

64. PROGRESS MEETINGS

Contractor shall hold a progress meeting at a time, date and frequency set forth in the pre-construction meeting to review progress to date and resolve all questions for the upcoming progress meeting. Engineer is responsible for the preparation of the progress meeting agenda and minutes. Engineer will forward progress meeting agenda to the Contractor for any additions to agenda.

AGREEMENT

THIS AGREEMENT, made this _____, by and between **the County of Chesterfield, Virginia**, hereinafter called "OWNER" and _____ doing business as _____ (an Individual) or (a Partnership) or (a Corporation) hereinafter called "CONTRACTOR".

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned:

1. The CONTRACTOR shall commence and complete construction of

2. The CONTRACTOR shall furnish all of the material, supplies, tools, equipment, labor and other services necessary for the construction and completion of the PROJECT described herein.
3. The CONTRACTOR shall commence the work required by the CONTRACT DOCUMENTS within Ten (10) calendar days after the date of the NOTICE TO PROCEED. Work shall be substantially complete within _____ calendar days unless the period for completion is extended otherwise by the CONTRACTOR DOCUMENTS. Work shall be finally complete and ready for final payment within _____ calendar days unless the period for completion is extended otherwise by the CONTRACT DOCUMENTS.
4. The CONTRACTOR shall perform all of the WORK described in the CONTRACT DOCUMENTS and shall comply with the terms therein for the sum of \$____ or as shown in the BID schedule.
5. The term "CONTRACT DOCUMENTS" means and includes the following:
 - (A) Instructions to BIDDERS
 - (B) BID FORM
 - (C) BID BOND
 - (D) Agreement
 - (E) General Conditions
 - (F) Supplemental General Conditions

COUNTY NO. _____

(G) Labor and Material Payment BOND

(H) Performance BOND

(I) Notice to Award

(J) Notice to Proceed

(K) Change Order

(L) DRAWINGS prepared by _____
numbered _____ through _____, and dated _____

(M) SPECIFICATIONS prepared or issued by _____
dated _____, 20____.

(N) ADDENDA:

No. _____, dated _____, 20____.

No. _____, dated _____, 20____.

No. _____, dated _____, 20____.

No. _____, dated _____, 20____.

No. _____, dated _____, 20____.

No. _____, dated _____, 20____.

6. The OWNER shall pay the CONTRACTOR in the manner and at such times as set forth in the General Conditions such amounts as required by the CONTRACT DOCUMENTS.

7. The undersigned Contractor shall indemnify and hold the County of Chesterfield, Virginia (the "County"), and its officers, agents, and employees harmless from and against all claims, damages, losses and expenses including attorneys fees arising out of or resulting from the performance or nonperformance of the work, including but not limited to any such claim, damage, loss or expense, that is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, including the loss of use resulting therefrom, or to economic loss; provided, however, that the Contractor's indemnification obligation under this agreement shall be limited to claims, damages, losses, and expenses caused in whole or in part by any act or omission of the Contractor, or any Subcontractor (a "Subcontractor") performing work required by the Contractor's Contractor or any Subcontractor my be liable, regardless of whether or not such claims, damages, losses, and expenses are caused in part by a party indemnified hereunder.

COUNTY NO. _____

The Contractor's indemnification obligation hereunder with respect to any and all claims against the County or any of its officers, agents or employees, by any employee or statutory employee of the Contractor, or of any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts the Contractor or Subcontractor may be liable, shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under Worker's Compensation Acts, Disability Benefit Acts or other Employee Benefit Acts.

The Contractor's indemnification obligation hereunder shall not extend to the liability of the Engineer, his agent or employees arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications, or (2) the giving of or the failure to give directions or instructions by the Engineer, his agents or employees provided such giving or failure to give is the primary cause of the injury or damage. The Contractor's indemnification obligation contained in this paragraph are in addition to any other indemnification obligation of the Contractor set forth within the Contract Documents.

8. This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.
9. During the performance of this Contract, the Contractor agrees as follows:
 - (A) The Contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin, except where religion, sex or national origin is a bona fide occupational qualification reasonably necessary to the normal operation of the Contractor. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.
 - (B) The Contractor, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, will state that such Contractor is an equal opportunity employer.
 - (C) Notices, advertisements and solicitations placed in accordance with federal law, rule or regulation, shall be deemed sufficient for the purpose of meeting the requirements of this section.

The contractor shall include the provisions of the foregoing paragraphs (A), (B) and (C) in every subcontract or purchase order of over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.

COUNTY NO. _____

CONTRACTOR

BY _____
(Signature)

NAME _____
(Typed or Printed)

TITLE _____

ADDRESS _____

(SEAL)

ATTEST:

(Secretary)

NAME _____
(Please Type)

(Affix Corporate Seal)

CHESTERFIELD COUNTY

BY _____
(Signature)

NAME _____
(Typed or Printed)

TITLE _____

(SEAL)

ATTEST:

NAME _____
(Please Type)

TITLE _____

COUNTY NO. _____

CHESTERFIELD COUNTY
DEPARTMENT OF UTILITIES
PERIODIC ESTIMATE FOR PARTIAL PAYMENT

For Period of _____ 20 ____ to _____ 20 ____, inclusive

CONTRACT NO. _____ ESTIMATE NO. _____

PROJECT NAME _____

NAME OF CONTRACTOR _____

ADDRESS _____

[illegible]

CHANGE ORDERS						
No.	Date	Description	Amount		Amount Completed to Date	
		TOTALS				

ANALYSIS OF WORK PERFORMED

1. Value of original contract completed to date _____
2. Change Order completed to date _____
3. Materials on site (attach detailed schedule)..... _____
4. Total value of work performed to date..... _____
5. Less amount retained, five percent (5%)..... _____
6. Net amount earned on contract work to date..... _____
7. Less amount of previous payments _____
8. **BALANCE DUE THIS PAYMENT** _____

CERTIFICATION BY CONTRACTOR

I certify that all items and amounts shown on this estimate are correct; that all work has been performed and/or materials supplied in full accordance with the terms of the contract between the County of Chesterfield, Virginia, and the undersigned, dated _____.

Contractor

_____ 20_____

By : _____

Title: _____

CERTIFICATION BY UTILITIES INSPECTION

I certify that this estimate is correct and just and that payment of the above amount is due.

By: _____ 20_____

CERTIFICATION BY ENGINEER

I certify that this estimate is correct and just and that payment of the above amount is due.

By: _____ 20_____

APPROVED FOR PAYMENT
CHESTERFIELD COUNTY, DEPARTMENT OF UTILITIES

By: _____ 20_____

NOTICE OF AWARD

TO: _____

Re: Project Number _____

Project Name _____

Dear _____:

Chesterfield County has reviewed the bid submitted by you for the above described work in response to its Advertisement for Bids dated _____, 20_____, and Information for Bidders. On _____, 20_____, the Board of Supervisors awarded this project to _____ in the amount of _____.

You are required by the Information for Bidders to execute the Agreement and furnish the required Contractor's Performance Bond, Payment Bond and Certificates of Insurance within fifteen (15) calendar days from the date of this notice to you.

If you fail to execute said Agreement and to furnish said Insurance Certificate (s) and Bond within fifteen (15) days from the date of this Notice, we may consider all your rights arising out of our acceptance of your Bid as abandoned and as a forfeiture of your Bid Bond. We will be entitled to such other rights as may be granted by law.

By copy of this letter, we are requesting that the Engineer submit to you four (4) copies of the Contract Documents for execution. We are also requesting that the Engineer send one (1) complete set of plans and specifications to the Construction Section for their use. After execution of the Contract Documents, please return to the Purchasing Department, attention Donna Clark.

Please acknowledge and return a copy of this Notice of Award within five (5) days from the date of this letter. Also, please include a signed copy of this notice in the five (5) contract documents being forwarded to you for execution.

COUNTY NO. _____

Dated this _____ day of _____, 20____.

COUNTY OF CHESTERFIELD

By _____

Title _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged

By _____

this the _____ day of _____, 20____.

By _____ Title _____

cc: Purchasing Department
Engineer

COUNTY NO. _____

NOTICE TO PROCEED

DATE

TO: _____

Re: _____ Project Number _____
Project Name _____

Dear _____:

You are hereby notified to commence WORK in accordance with the Agreement dated _____, 20_____, within ten (10) calendar days from the date of this letter, and you are to complete the WORK within _____ consecutive calendar days thereafter. The date of the completion of all work is _____.

Prior to commencing work on _____, you are required to schedule a pre-construction meeting. This meeting may be scheduled by contacting the Utilities Department Construction Section at 796-7125.

Please acknowledge and return a copy of this Notice to Proceed within five (5) days from the date of this letter.

COUNTY OF CHESTERFIELD

By _____

Title _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO

PROCEED is hereby acknowledged by

this the _____ day of

_____, 20_____

By _____

Title _____

COUNTY NO. _____

CHANGE ORDER

Project No. _____ Order No. _____

Date: _____

NAME OF PROJECT: _____

OWNER: Chesterfield County

CONTRACTOR: _____

The following changes are hereby made to the CONTRACT DOCUMENTS:

DESCRIPTION OF CHANGES:

JUSTIFICATION:

CHANGE TO CONTRACT PRICE:

	Decrease in Contract Price	Increase in Contract Price
	\$ _____	\$ _____

TOTALS \$ _____ \$ _____

NET CHANGE IN CONTRACT PRICE \$ _____

COUNTY NO. _____

Original Contract Price	\$ _____
Previously Approved Change Orders	\$ _____
Current Adjusted Contract Price	\$ _____
The contract price due to this	
Change Order will be (Increased),	
(Decreased) by	\$ _____
The new adjusted contract price	
including this Change Order	\$ _____

CHANGE TO CONTRACT TIME:
(Must be completed with all change orders
even when no change in Contract Time is made.)

Original Contract Time	_____ Days
Previously Approved Change Orders	_____ Days
Current Adjusted Contract Time	_____ Days
The contract time due to this	
Change Order will be (Increased),	
(Decreased) (Unchanged) by	_____ Days
The new adjusted contract time	
including this Change Order will be	_____ Days

This document will become a supplement to the Contract and all provisions will apply hereto.

Requested by	_____	_____
	(Contractor) (Pres. or V-P)	(Date)
Recommended by	_____	_____
	(Engineer)	(Date)
Accepted by	_____	_____
	(Project Manager)	(Date)
Approved by	_____	_____
	(County Administrator)	(Date)

COUNTY NO. _____

BONDS

A Bid Bond, made payable to the Owner, will be required of all Bidders in the amount specified in the "Instructions to Bidders

A Labor and Material Payment Bond and a Performance Bond, each in the amount of 100% of the Contract Price, including additions or deductions, with a corporate surety authorized to do business in the State of Virginia and otherwise acceptable in all respects to the Owner's Attorney will be required for the faithful performance of the Contract. The Bonds shall be on the forms included in these Specifications. The Contractor shall show satisfactory evidence of compliance with all bond requirements before entering into any agreement to sublet any of the work to be done under this Contract. The bonds shall protect the Owner from claims from persons or firms performing labor or furnishing materials and from claims for damages, claims, losses or other expenses to the Owner, including any attorney's fees, arising from failure of the Contractor to perform the Contract, or to correct defective materials or workmanship. Such bonds shall remain in force for a period of at least twelve months after the completion and final acceptance of the project by the Owner. Executed copies of the Labor and Material Payment and Performance Bonds shall be bound with, and become a part of, all copies of the Contract. Prior to the issuance of any bond required by this Contract, the Contractor or Subcontractor shown as principal on the bond shall furnish the insurance company issuing the bond with a copy of the Contract.

Attorneys-in-fact who sign Bid Bonds, Labor and Material Payment Bonds and Performance bonds must file with each bond a certified and effective dated copy of their power of attorney. Each Bid Bond and the accompanying power of attorney should bear the same date. Each Labor and Material Payment Bond and each Performance Bond and the accompanying power of attorney should bear the same date as the date of the Contract.

The party to whom the Contract is awarded will be required to execute the Contract and obtain the Labor and Material Payment Bond and the Performance bond within fifteen calendar days from the date when the Notice of Award together with the Contract is delivered to the Bidder for execution. In case of the failure of the Bidder to execute the Contract within the prescribed time, the Owner may, at his option consider the Bidder in default, in which case the Bid Bond accompanying the Bid shall be forfeited as allowed by law.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That

(Name of Contractor)

(Address of Contractor)

a _____, hereinafter called Principal, and
(Corporation, partnership, or individual)

(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto _____

(Name of Owner)

(Address of Owner)

hereinafter called OWNER, in the penal sum of _____
_____ Dollars (\$ _____)

in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the _____ day of _____, 20_____, a copy of which is hereto attached and made a part hereof for the construction of:

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions which may be granted by the OWNER, with or without notice to the Surety and during the one year guarantee period, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which

COUNTY PROJECT NO. _____

the OWNER may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said surety, for value received hereby stipulates and agrees that its obligation on this bond shall extend and apply to said contract dated the ____ day of _____, 20____ and to such contract as it may be amended or otherwise modified by any change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying the same, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in ____ counterparts, (number) each one of which shall be deemed an original, this the ____ day of _____, 20____.

ATTEST:

_____ (Principal) Secretary	_____ Principal
(SEAL)	BY _____(s)

_____ (Witness as to Principal)	_____ (Address)
_____ (Address)	_____ Surety

ATTEST:

_____ Witness as to Surety	BY _____ Attorney-In-Fact
_____ (Address)	_____ (Address)

NOTE: Date of BOND must not be prior to date of CONTRACT.
If CONTRACTOR is Partnership, all partners should execute BOND.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the PROJECT is located.

COUNTY PROJECT NO. _____

LABOR AND MATERIAL
PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: That

(Name of Contractor)

(Address of Contractor)

a _____, hereinafter called Principal, and
(corporation, partnership or individual)

(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto _____

(Name of Owner)

(Address of Owner)

hereinafter called OWNER, in the penal sum of _____
_____ Dollars, (\$_____)

in lawful money of the United States, for the payment of which sum well
and truly to be made, we bind ourselves, successors, and assigns, jointly
and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas the Principal
intered into a certain contract with the OWNER, dated the ____ day
of _____ 20____, a copy of which is hereto attached and
made a part hereof, for the construction of:

NOW, THEREFORE, if the Principal shall promptly make payment to all
persons, firms, SUBCONTRACTORS, and corporations furnishing materials for
or performing labor in the prosecution of the WORK provided for in such
contract and any authorized extension or modification thereof, including
all amounts due for materials, lubricants, oil, gasoline, coal and coke,
repairs on machinery, equipment and tools, consumed or used in connection
with the construction of WORK, and all insurance premiums on said WORK,
and for all labor performed in such WORK whether by SUBCONTRACTOR or
otherwise, then this obligation shall be void; otherwise to remain in full
force and effect.

COUNTY PROJECT NO. _____

PROVIDED FURTHER, that the said Surety for value received hereby stipulates and agrees that its obligation on this bond shall extend and apply to said Contract dated the _____ day of _____, 20____ and to such Contract as it may be amended or otherwise modified by any change, extension of time, alteration or addition to the terms of the Contract or to the WORK or to the SPECIFICATIONS accompanying same, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts
(number)
one of which shall be deemed an original, this the _____ day of _____
_____ 20_____.

ATTEST:

(Principal Secretary)

(Principal)
BY _____ (s)

(Address)

Witness as to Principal

(Address)

Surety

ATTEST:

BY _____
Attorney-In-Fact

Witness as to Surety

(Address)

Address

NOTE: Date of BOND must not be prior to date of Contract. If CONTRACTOR is Partnership, all partners should execute BOND.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the PROJECT is located.

COUNTY PROJECT NO. _____

INSURANCE

The Contractor shall purchase and maintain in force, at his own expense, such insurance as will protect him from claims set forth below which may arise out of or result from the Contractor's execution of the work, whether such execution be by himself, his employees, agents, subcontractors, or by anyone for whose acts any of them may be liable. The insurance coverage shall be such as to fully protect the Contractor, Owner, and the Engineer and the general public from any and all claims for injury and damage resulting by any actions on the part of the Contractor, or his forces enumerated above. The Contractor shall furnish a copy of a certificate of insurance, naming Chesterfield as an additional insured. Should any of the policies be canceled before the expiration date, the issuing company will mail 30 days written notice to the certificate holder. The Contractor shall furnish insurance in satisfactory limits, and on forms and of companies which are acceptable to the Owner's Attorney and/or Risk Management and shall require and show evidence of insurance coverages on behalf of any subcontractors before entering into any agreement to sublet any part of the work to be done under this Contract.

The following insurance requirements are the minimum that will be acceptable:

1. Worker's Compensation Insurance with statutory limits and Employers' Liability Insurance of \$500,000 for one accident or aggregate disease.
2. Commercial General Liability - Including products and completed operations coverage; \$1,000,000 each occurrence; no exclusion for X, C, or U hazards allowed.
3. Comprehensive Automobile Liability
 - (a) Bodily Injury \$1,000,000 Each Person
\$1,000,000 Each Occurrence
 - (b) Property Damage \$1,000,000 Each Occurrence
4. Umbrella Liability Insurance \$2,000,000 Each Occurrence
5. The Contractor shall name as additional insureds on the CGL policy those property owners requesting this, if the work will take place on their property. The Contractor shall provide Certificates of Insurance evidencing this to the property owners and Owner's Risk Manager.

The Contractor shall be responsible for maintaining current certificates of insurance on file with the Owner, and the Insurance Company shall be responsible for notifying the Owner thirty (30) days prior to the expiration, cancellation, non-renewal, or material change in the coverage.

The Contractor shall be responsible for continuing in force completed operations, bodily injury and property damage coverage for a minimum of two (2) years after completion and acceptance of the work.

INSTRUCTIONS REGARDING INSURANCE CERTIFICATES

The Contractor and his insurance company should carefully review the insurance requirements applicable to this job. All requirements must be met before the County will execute the contract. In particular, we would call your attention to the following:

1. Please note that the Insurance Certificate must state that the Commercial General Liability and the Umbrella Liability Insurance Policies name Chesterfield County as additional insured. This requirement may be met by placing the following language on the Certificate. Many Certificates have a space headed "**OTHER**" where the language may be inserted as follows:

All general liability and excess liability policies coverages listed hereon name Chesterfield County as additional insured.

2. The Insurance Certificate must also contain the required statement concerning notice of cancellation or other change in coverage. The statement used on some Certificate forms is not acceptable. The statement which is required by the contract documents reads as follows:

"Such certificate shall provide that in the event of the cancellation of the policy or policies listed on such certificate, not less than 30 days notice in writing shall be given to the County. **NOTE:** The cancellation clause in the Insurance Certificate should be modified by striking the words 'endeavor to' in the second line and by striking the clause reading 'but failure to mail such notice shall impose no obligation or liability of any kind upon the company'."

3. The Certificate Holder should be listed as:

County of Chesterfield, VA
c/o Purchasing Department
P. O. Box 51
Chesterfield, VA 23832-0051

4. Bid, job, or subject name must appear on Certificate for identification purposes.
5. Certificate of Insurance must have a signature.

Compliance with all five of the above requirements is demonstrated on the attached blank certificate form.

S A M P L E

CERTIFICATE OF INSURANCE					ISSUE DATE (MM/DD/YY)		
PRODUCER		THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. COMPANIES AFFORDING COVERAGE					
INSURED		<u>COMPANY LETTER A</u> <u>COMPANY LETTER B</u> <u>COMPANY LETTER C</u> <u>COMPANY LETTER D</u> <u>COMPANY LETTER E</u>					
COVERAGES							
This is to certify that policies of insurance listed below have been issued to the insured named above for the policy period indicated. Notwithstanding any requirement, term or condition of any contract or other document with respect to which this certificate may be issued or may pertain, the insurance afforded by the policies described herein is subject to all the terms, exclusions, and conditions of such policies.							
CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY DATE	POLICY EFF. DATE	LIABILITY LIMITS IN THOUSANDS		
	GENERAL LIABILITY ___ Comprehensive Form ___ Premises/Operations ___ Underground Explosion & Collapse Hazard ___ Products/Completed Operations ___ Contractual ___ Independent Contr. ___ Broad Form ___ Property Damage ___ Personal Injury					EACH OCCURRENCE	AGGREGATE
					BODILY INJURY	\$	\$
					PROPERTY DAMAGE	\$	\$
					BI & PD COMBINED	\$	\$
					Personal Injury		\$
	AUTOMOBILE LIABILITY ___ Any Auto				Bodily Injury \$ (per person)		\$
	___ All Owned Autos (Priv. Pass.)				Bodily Injury \$ (per accident)		\$
	___ Hired Autos				Property Damage \$		\$
	___ Non-Owned Autos				BI & BD Combined \$		\$
	___ Garage Liability ___						
	EXCESS LIABILITY ___ Umbrella Form ___ Other Than Umbrella Form				BI & BD Combined \$		\$
	Workers= Compensation and Employers= Liability				Statutory \$ (Each Accident) \$ (Disease-Policy Limit) \$ (Disease-Each Employee)		
	OTHER All general liability and excess liability policies coverages listed hereon name the County of Chesterfield, Virginia, as an additional insured.						
DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS							
CERTIFICATE HOLDER				CANCELLATION			
County of Chesterfield, Virginia c/o Purchasing Department P.O. Box 51 Chesterfield, Virginia 23832-0051				The Insurance Company issuing each of the policies listed hereon shall mail the certificate holder notice of any expiration, cancellation, non-renewal, or material change in coverage 30 days prior to the effective date of any such expiration, cancellation, non-renewal, or material change in coverage.			

**COUNTY OF CHESTERFIELD
ESCROW AGREEMENT**

THIS AGREEMENT, made and entered into this ____ day of _____,
20____ by, between, and among the County of Chesterfield ("County"),

(Address of Contractor)

(Name of Bank)

(Address of Bank)

a trust company, bank, or savings and loan institution with its principal
office located in the Commonwealth of Virginia (hereinafter referred to
collectively as "Bank") and _____
(Name of Surety)

(Address of Surety)

("Surety") provides:

I.

The County and the Contractor have entered into a contract for work
identified by Bid No. _____ for _____

("the contract"). This Agreement is pursuant to, but in no way amends or
modifies, the contract. Payments made hereunder or the release of funds
from escrow shall not be deemed approval or acceptance by the County of
the performance of the Contractor under this contract.

II.

In order to assure full and satisfactory performance by the
Contractor of its obligations under the contract, the County will retain
certain amounts otherwise due the Contractor. The Contractor has, with
the approval of the County, elected to have these retained amounts held in
escrow by the Bank. This agreement sets forth the terms of the escrow.
The Bank shall not be deemed a party to, bound by, or required to inquire
into the terms of, the contract or any other instrument or agreement
between the County and the Contractor.

The County shall from time to time pursuant to its contract pay to
the Bank amounts retained by the County under the contract. Except as to
amounts actually withdrawn from escrow by the County, the Contractor shall
look solely to the Bank for the payment of funds retained under the
contract and paid by the County to the Bank.

III.

The risk of loss by diminution of the principal of any funds invested under the terms of this contract shall be solely upon the Contractor.

Funds and securities held by the Bank pursuant to this Escrow Agreement shall not be subject to levy, garnishment, attachment, lien, or other process whatsoever. Contractor agrees not to assign, pledge, discount, sell or otherwise transfer or dispose of his interest in the escrow account or any part thereof, except to the Surety.

IV.

Upon receipt of checks or warrants drawn by the County Treasurer and made payable to the Bank as escrow agent, the Bank shall promptly notify the Contractor, negotiate the same and deposit or invest and reinvest the proceeds in approved securities in accordance with the written instruction of the Contractor. In no event shall the Bank invest the escrowed funds in any security not approved.

V.

The following securities, and none other, are approved securities for all purposes of this Agreement:

- (1) United States Treasury Bonds, United States Treasury Notes, United States Treasury Certificates of Indebtedness or United States Treasury Bills,
- (2) Bonds, notes and other evidences of indebtedness unconditionally guaranteed as to the payment of principal and interest by the United States,
- (3) Bonds or notes of the Commonwealth of Virginia,
- (4) Bonds of any political subdivision of the Commonwealth of Virginia, if such bonds carried, at the time of purchase by the Bank or deposit by the Contractor, a Standard and Poor's or Moody's Investors Service rating of at least "A", and
- (5) Certificates of deposit issued by commercial Banks located within the Commonwealth of Virginia, including, but not limited to, those insured by the Bank and its affiliates,
- (6) Any bonds, notes, or other evidences of indebtedness listed in Sections (1) through (3) may be purchased pursuant to a repurchase agreement with a bank, within or without the Commonwealth of Virginia having a combined capital, surplus and undivided profit of not less than \$25,000,000, provided the obligation of the Bank to repurchase is within the time limitations established for investments as set forth herein. The repurchase agreement shall be considered a purchase of such securities even if title, and/or possession of such securities is not transferred to the Escrow Agent, so long as the repurchase obligation of the Bank is collateralized by the securities themselves, and the securities have on the date of the repurchase agreement a fair market value equal to at least 100% of the amount of the repurchase obligation of the Bank, and the securities are held by a third party, and segregated from other securities owned by the Bank.

No security is approved hereunder which matures more than five years after the date of its purchase by the Bank or deposit by the Contractor.

VI.

Upon receipt of a direction signed by the County Administrator of the County, the Bank shall pay the principal of the fund, or any specified amount thereof, to the County Treasurer. Such payment shall be made in cash or certified check as soon as is practicable after receipt of the direction.

Upon receipt of a direction signed by the County Administrator of the County, the Bank shall pay and deliver the principal of the fund, or any specified amount thereof, to the Contractor, in cash or in kind, as may be specified by the Contractor. Such payment and delivery shall be made as soon as is practicable after receipt of the direction.

VII.

For its services hereunder the Bank shall be entitled to a reasonable fee in accordance with its published schedule of fees or as may be agreed upon by the Bank, the County, and the Contractor. Such fee and any other costs of administration of this Agreement shall be paid from the income earned upon the escrowed fund and, if such income is not sufficient to pay the same, by the Contractor.

VIII.

The net income earned and received upon the principal of the escrowed fund shall be paid over to the Contractor in quarterly installments. Until so paid, or applied to pay the Bank's fee or any other costs of administration, such income shall be deemed a part of the principal of the fund.

IX.

The Surety undertakes no obligation hereby but joins in this Agreement for the sole purpose of acknowledging that its obligations as surety for the Contractor's performance of the contract are not affected hereby.

WITNESS the following signatures, all as of the day and year first above written.

CHESTERFIELD COUNTY

By:

County Administrator

Approved as to form:

County Attorney

Bank

By:

Title:

Contractor

By:

Title:

Surety

By:

Title:

Distribution: Bank
Accounting
Contractor
Purchasing
Architect/Engineer
Originating County Department

**NOTIFICATION LETTER
SAMPLE
(CONTRACTOR'S LETTERHEAD)**

Date

Property Owner(s)
Mailing Address
City, State, Zip

Re: County Project # _____
Project Name
Property Address/Description

Dear _____:

Our firm will be installing a (water/sewer) line which will serve properties in your area. A portion of this line will be constructed within an easement on your property. We propose to start work on this project on or after _____.

If you have any concerns or questions during construction, feel free to call me at _____ or you may call the Engineering Supervisor of the Utilities Department Construction Section at 796-7125.

Sincerely,

(Name)

(Title)

cc: Developer
Utility Department Construction Section

SECTION 1
SITE CLEARING

I - GENERAL

1.01 RELATED DOCUMENTS

The Plans and General Provisions of the Contract, including General and Supplementary Conditions, apply to the work specified in this Section.

1.02 DESCRIPTION OF WORK

The Contractor shall furnish all labor, materials, equipment and supplies and shall perform all work and services necessary for or incidental to the performance and completion of all site clearing and grubbing, protection and/or replacement of property pins, removal and disposal of debris resulting from site clearing and grubbing, backfilling to original level of any depressions resulting from such removal, and the protection of existing trees and vegetation.

II - PRODUCTS

Not applicable to work of this Section.

III - EXECUTION

3.01 GENERAL

The Contractor shall remove trees, including stumps and roots, shrubs, grass, flowers and other vegetation interfering with installation of new construction. He shall carefully and cleanly cut roots and branches of trees that will remain where such roots and branches obstruct new construction.

3.02 LIMITS FOR SITE CLEARING & GRUBBING

Site clearing and grubbing activities shall be limited to those areas designated on the construction drawings as being within the limits of construction or within easements and rights-of-way designated for the work. Under no circumstances will the Contractor be allowed to occupy or cut outside the limits established for the work without written permission of the property owner. Clearing and grubbing shall be as indicated on the approved erosion control plan.

3.03 CLEARING

Clearing shall consist of the removal from above the surface of existing ground standing trees, shrubs, brush, downed timber, rotten wood, heavy growth of grass and weeds, flowers, vines, rubbish and other debris. Trees may remain the property of the landowner and shall be removed or cut in lengths as mutually agreed to by the owner and the landowner. If the landowner does not want the wood, it shall be properly removed and disposed of by the Contractor.

3.04 GRUBBING

Grubbing shall consist of the removal and disposal of stumps, roots, root mats and other debris to a depth of not less than 18 inches below existing ground elevation.

3.05 ORNAMENTAL TREES, SHRUBS AND FLOWERS

Existing ornamental trees, shrubs and flowers shall be removed in such a manner as not to destroy their viability and shall be stored at or near the site of their removal as approved by the Owner. Such trees, shrubs and flowers shall be maintained in an acceptable manner, watered and protected to maintain healthy growth during the construction period. Said trees, shrubs and flowers shall be replanted as soon as possible or, if so directed, removed from the site. Any trees, shrubs or flowers rendered unusable shall be replaced by the Contractor with approved stock.

3.06 PROTECTION

- A. The Contractor shall protect existing trees and other vegetation that is to remain in place against unnecessary cutting, breaking or skinning of roots, skinning and bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Temporary fences, barricades or guards are to be provided as required to protect trees and vegetation to be left standing.
- B. Trees and other vegetation to remain within limits of contract work shall be watered as required to maintain their health during course of construction operations.
- C. Provide protection for roots over 1-1/2" diameter cut during construction operations. Coat cut faces with a wound paint formulated for use on damaged plant tissues. Temporarily cover exposed roots with wet burlap to prevent roots from drying out; cover with earth as soon as possible.
- D. Repair or replace trees and vegetation that will remain, which are damaged by construction operations, in a manner acceptable to the Owner. Owner may employ an Arborist to repair damages to trees and shrubs at the Contractor's expense when deemed necessary.
- E. Fill depressions caused by clearing and grubbing operations with suitable soil material, unless further excavation or earthwork is indicated. Fill material shall be placed in horizontal layers not exceeding 6" loose depth, and thoroughly compacted to a 90% density equal to adjacent original ground.

3.07 DISPOSAL OF WASTE MATERIALS

- A. The Contractor shall remove all waste material weekly, weather permitting, from the site and shall dispose of it in a legal manner such as an approved landfill. Proper disposal guidelines may be found in, but not necessarily limited to, the County's "Debris Manifest Ordinance".
- B. Burning of combustible materials on-site is prohibited.

3.08 EROSION CONTROL

All activity performed under this section shall conform in strict compliance with Section 3 entitled "[Erosion and Sediment Control](#)" of this document.

End of Section

SECTION 2
SITE DEMOLITION

I - GENERAL

1.01 RELATED DOCUMENTS

The Plans general provisions of the Contract, including General and Supplementary Conditions, apply to the work specified in this Section.

1.02 DESCRIPTION OF WORK

Exact extent of the site demolition may not be fully indicated on the plans. Determine the nature and extent of site demolition that will be necessary by comparing the Contract Documents with existing conditions. Perform all work of a demolition nature that may be required or necessary to a full completion of the Work, whether or not shown or specified.

- A. Demolition includes removal of all existing site improvements which interfere with new construction, and disposal of demolished materials from the site.
- B. Provide an orderly sequence of demolition and removal to ensure the uninterrupted progress of operations.

1.03 JOB CONDITIONS

- A. Conditions:
 - 1. Conditions of Site Improvements: The Owner assumes no responsibility for the actual condition of site improvements to be demolished.
 - 2. Conditions existing at the time of inspection for bidding purposes will be maintained by the Owner in so far as practicable. However, variations within the structure may occur by Owner's removal and salvage operations prior to the start of the demolition work.
- B. Explosives: The use of explosives will be permitted only upon approval by the owner with appropriate permits and only in accordance with the "Rules and Regulations Governing Manufacture, Storage, Handling, Use and Sale of Explosives" issued by the Department of Labor and Industry.

C. Traffic:

1. Conduct demolition operations and the removal of debris to ensure minimum interference with roads, streets, walks and other adjacent occupied or used facilities.
2. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

D. Damage: Promptly repair damage caused to adjacent facilities by demolition operations to the satisfaction of the Owner.

II - PRODUCTS

Not Applicable.

III - EXECUTION

3.01 DEMOLITION

- A. Pollution Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit the amount of dust and dirt rising and scattering in the air to the lowest practical level. Comply with governing regulations pertaining to environmental protection.
1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.
 2. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations, as directed by the Owner or governing authorities. Return adjacent areas to condition existing prior to the start of the work.
- B. Below-Grade Construction: Demolish and remove below-grade construction and concrete slabs-on-grade.
- C. Filling of Holes, Pits, and Foundations:
1. Fill with suitable material to within 4 inches of finished grade in lawn areas, compact to 9001 density and topsoil to finished grade.
 2. Fill with suitable material to within 12 inches of finished grade in structural areas and compact as specified in [Section 4 - Trenching, Backfill and Compaction](#).

3.02 DISPOSAL OF DEMOLISHED MATERIALS

- A. Burning of removed materials from demolished structures on-site is prohibited.
- B. Transport materials removed from demolished structures weekly, weather permitting, and legally dispose of off the site such as an approved landfill. Proper disposal guidelines may be found in, but not necessarily limited to, the County's "Debris Manifest Ordinance".

End of Section

SECTION 3
EROSION AND SEDIMENT CONTROL

I - GENERAL

1.01 RELATED DOCUMENTS

Plans and general provisions of the Contract, including General and Supplementary Conditions and Specification sections, apply to work specified in this Section. In addition, all work performed on this project shall conform to all rules and regulations set forth by the Virginia Soil and Water Conservation Commission in its "Erosion and Sediment Control Handbook," Chesterfield County and/or any other regulatory agency which has control or jurisdiction over erosion and sedimentation control in the area in which the project is located.

1.02 DESCRIPTION OF WORK

The Contractor shall furnish all labor, materials, equipment and services necessary for, and reasonably incidental to, preventing pollution of land, air and water and for controlling run-off and erosion of soil. Erosion and sediment control shall be accomplished so as to preclude sedimentation in general and in particular, of the County's stormwater system.

1.03 GENERAL CONTROL MEASURES

- A. All disturbed areas including but not restricted to stock piles, dams, banks of sediment basins and temporary road banks left unprotected for more than 30 days shall be temporarily seeded within 7 days at the Contractor's expense.
- B. All disturbed areas shall be protected to control erosion and prevent sedimentation of adjacent properties, storm sewers and/or streams.
- C. Sediment control devices such as diversion berms, sediment traps, filter berms, vegetation stabilization, etc., shall be used to prevent off-site sedimentation at all times.
- D. All borrow and/or spoil materials shall only be stockpiled within the limits of the permitted site.
- E. The proposed grading shall not impair existing surface drainage, constitute a potential erosion hazard, or source of sedimentation to any adjacent property, drainage system or right-of-way.
- F. All points of construction ingress and egress shall be protected to prevent tracking of mud on the public streets.

1.04 STORM DRAINAGE CONTROL

If during construction of the utility system the Contractor disrupts the storm drainage, the storm drainage will be piped into the storm drainage system when required or handled by providing positive drainage onto stable areas at nonerosive velocities and in a manner consistent with established drainage patterns. Temporary storm drainage systems shall be approved by the County.

1.05 STABILIZATION

- A. Within fifteen days of achieving final grade, all disturbed areas shall be stabilized with permanent vegetation and permanent mulch.
- B. For vegetating critical areas adequate mulch, fertilizer and type of seed will be placed to ensure a vigorous ground cover and such application will be repeated if necessary until such growth is established.
- C. Sediment control measures may not be removed or relocated without the approval of the Inspector.

II - PRODUCTS

2.01 STRAW BALES AND SILT FENCES

Straw bales and fabric silt fences shall be installed in accordance with the [County Standard Details](#) or as reflected in the latest edition of the Erosion Control and Sedimentation Handbook. Straw bales shall be of standard size.

2.02 GROUND LIMESTONE

Ground limestone shall contain a minimum of 88% of calcium and magnesium carbonates. A total of 100% shall pass the 10 mesh sieve; a minimum of 90% shall pass the 20 mesh sieve; and a minimum of 60% shall pass the 100 mesh sieve. Each container of package limestone shall be clearly marked with the name of the material, net weight of contents, manufacturer's name and guaranteed analysis. Upon Owner's request bulk shipments shall be accompanied by a certificate covering the names, weight, and the analysis specified herein.

2.03 COMMERCIAL FERTILIZER

- A. The basic mix shall be 10-10-10 formula, one-half of the nitrogen being in the form of organic nitrogen and shall conform to the applicable State fertilizer laws. It shall be uniform in composition, dry and free flowing and shall be delivered to the site in the original, unopened containers, each bearing the manufacturer's guaranteed analysis.

- B. Any fertilizer which becomes caked or otherwise damaged, making it unsuitable for use, will not be accepted. The basic mix may be altered at the Engineer's discretion, based upon laboratory reports.

2.04 WATER

Water shall be clean potable water.

2.05 TEMPORARY SEEDING

- A. Seed shall be fresh, clean, of the latest crop conforming to the current purity and germination standards of the Atlantic Seedmens Association and mixed in the following proportions by weight.

B.

Planting Dates	Species	Rate (lbs./1000 s.f.)
Sept. 1 - Feb. 15	50/50 Mix of Annual Ryegrass (lolium Multi-Florum) & Cereal (Winter) Rye	2
Feb. 16 - Apr. 30	Annual Ryegrass (Lolium Multi-Florum)	2
May 1 - Aug. 31	German Millet (Setaria Italica)	1

- C. Upon request, by the Owner, the Contractor shall furnish a certified report by the approved seed testing laboratory, showing a test for purity, viability, and seed content of representative samples of the seed which are proposed for use.

2.06 MULCH

Mulch shall be straw, free from weed seeds.

2.07 LIQUID MULCH BINDERS

Liquid mulch binders shall be in accordance with the Virginia Erosion and Sediment control Handbook, latest edition.

III - EXECUTION

3.01 STRAW BALES AND SILT FENCES

The staked straw bales shall be placed as a first priority item. Each bale shall be staked with two wooden stakes at least 3 feet long. Straw bales shall be maintained throughout the life of this contract.

Silt fences shall be placed in strict accordance with [County Standard Details](#) and State requirements relating to the proper placement and maintenance of this erosion control measure to ensure effective use.

3.02 LIME

Distribute ground limestone evenly by machine over all areas. Disc or otherwise till it into the top 4 inches of the soil at least five days before seeding. The rate of application shall be 40 pounds per 1,000 square feet. This rate may be altered at the Engineer's or Inspector's discretion.

3.03 FERTILIZER

Distribute fertilizer evenly, by mechanical spreader, over all areas to be seeded and incorporate it into the top 4 inches of soil. Apply at the rate of 60 pounds per 1,000 square feet not more than one week prior to seeding. This rate may be altered at the Engineer's or Inspector's discretion.

3.04 SEEDING

Seed at the rate of 2 pounds per 1,000 square feet and lightly rake into soil.

3.05 MULCHING

Apply mulch to all seeded areas the same day as seeding. Spread uniformly by hand or mechanically at the rate of 1-1/2 to 2 tons per acre, or 70 to 90 pounds per 1,000 square feet.

3.06 MULCH BINDING

- A. Application of liquid binders should be heavier at edges where wind catches mulch, in valleys, and at crests of banks. Remaining area should be uniform in appearance.
- B. Apply at the rate recommended by the manufacturers' specifications.

3.07 GENERAL CONTROL MEASURES

The work site, and areas adjacent thereto, shall be kept clean and free of soil, straw or other materials incidental to the work of this section. Surface drainage from cuts and fills within the construction limits, whether or not completed, and from borrow and waste disposal areas, shall, if turbidity producing materials are present, be held in suitable sedimentation ponds or shall be graded to control erosion. Temporary erosion and sediment control measures such as berms, dikes, drains, or sedimentation basins, if required to meet the above standards, shall be provided and maintained until permanent drainage and erosion control

facilities are completed and operative. The area of bare soil exposed at any one time shall be held to a minimum. Fills and waste areas shall be constructed by a selective placement to eliminate silts or clays on the surface that will erode and contaminate adjacent rivers, streams, lakes, ponds, or properties.

3.08 STOCKPILING EXCAVATED MATERIAL

Contractor shall stockpile excavated material and spoils on the uphill side of the trench and the pipe and/or brush on the downhill side of the trench. Performing this effective control measure will minimize the need for straw bales and silt fences. Disturbance shall be kept to a minimum and methods of controlling erosion shall be performed in accordance with plans and specifications and Contractor is not relieved of his responsibility to perform construction practices which will prevent erosion more clearly defined in the local and State Erosion and Sediment Control Standards.

3.09 MAINTENANCE

Erosion control measures shall be maintained until permanent vegetation is established. During periods of operations, erosion control facilities shall be maintained in proper condition and silt removed as directed by the inspector. Removal of erosion control facilities shall include proper disposal of collected silt and debris. Improper erosion control maintenance or installation shall be grounds to stop work on project by the inspector.

3.10 INSTALLATION OF RIP RAP

Installation shall be in accordance with VDOT Road and Bridge Specifications, latest edition.

3.11 CONSTRUCTION IN A WETLAND OR WATER OF THE U.S.

The area of land disturbance must be kept to the minimum necessary for utility installation. Excavated material may be temporarily sidecast within the disturbed area, provided that it is placed upon a filter fabric and in a location that will not allow it to be dispersed by currents or other forces.

In wetlands, the top 6 to 12 inches of the trench should generally be backfilled with topsoil from the trench. Excess material must be removed to upland areas immediately upon completion of the utility line. Any exposed slopes must be stabilized immediately upon completion of the utility line.

In waters of the U.S., the original ditch cross-section must be re-established and stabilized with rip rap immediately upon completion of the utility line.

End of Section

SECTION 4

TRENCHING, BACKFILL AND COMPACTION

I - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions of the Contract, including General and Supplementary Conditions, apply to the work specified in this Section.

1.02 DESCRIPTION OF WORK

The Contractor shall furnish all labor, materials, equipment and supplies and shall perform all work and services necessary for all operations in connection with excavation, trenching, backfilling and compaction for the installation of underground utilities as indicated or specified. The work includes but is not limited to the installation of:

- A. Sanitary Sewers
- B. Water Piping
- C. Related Utility Appurtenances

1.03 QUALITY ASSURANCE

Work shall conform to County of Chesterfield requirements and, where construction is within the State right-of-way, the applicable requirements of the Virginia Department of Transportation.

1.04 SAFETY

It is a requirement of OSHA, VOSHA and these specifications that all safety measures including but not necessarily limited to trenching, confined space, traffic control and other applicable safety measures be strictly adhered to and enforced by the Contractor.

1.05 JOB CONDITIONS

- A. Protection of Existing Utilities: It shall be the responsibility of the Contractor to conduct the work in such a manner as to avoid damage to, or interference with, any utility services. If such damage, interference, or interruption of service occurs as a result of his work, it shall be the Contractor's responsibility to promptly notify the Owner and utility owner of the occurrence and to repair or correct it immediately, at his own expense, and to the satisfaction of the Owner and the owner of the utility.

Further, it shall be the Contractor's responsibility to uncover and expose the location of all service connections to avoid damage or interruption of service. If damage occurs, the Contractor shall make the necessary repairs in accordance

with the above requirements. It is also the responsibility of the Contractor to determine in advance of beginning his construction effort the exact location of all utilities, and the effect they will have on his work by contacting "Miss Utility" 48 hours prior to starting work. Telephone 1-800-552-7001 for assistance.

B. Protection of Persons and Property:

1. Barricade open excavations occurring as a part of this work and post with warning lights. Provide warning lights and other protective measures as recommended by authorities having jurisdiction.
2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

C. Equipment used for this work shall meet all local, State, Federal and any other applicable standards governing this work. All power machinery shall have adequate mufflers to keep noise to a minimum.

D. Site Information:

1. Data on indicated subsurface conditions, if any, are not intended as representations or warranties of accuracy or continuity between soil borings. It is expressly understood that Owner will not be responsible for interpretations or conclusions drawn therefrom by Contractor. Data is made available only for the convenience of Contractor.
2. Additional test borings and other exploratory operations may be made by Contractor or at the request of the owner at no cost to Owner.

1.06 COMPACTION

It is the intent of these specifications that the Contractor be responsible for the correct bedding of utility lines, backfill of pipe trenches, and compaction of backfill as outlined in this section. Where (in the inspector's opinion) excavated material is not suitable for backfill, select backfill must be used.

The County may require that the Contractor have density and compaction tests performed by a certified independent laboratory verifying that the trench backfill has been compacted as required. Any material not compacted as required shall be removed at the Contractor's expense and replaced, recompacted and retested. Any and all work performed by an independent laboratory is to be done under a purchase order from the Contractor. Verbal results of tests should immediately be given the Contractor and utility inspector. Two written copies of all reports by the independent

laboratory confirming the field results shall be given to the inspector within (48) hours of the field tests. Requirements for compaction are covered in further detail later in this section.

Where water and/or wastewater utilities are to be installed in the paved area of new roadways to be accepted into the state system, the requirements of the Virginia Department of Transportation Chesterfield Residency compaction procedures are to be followed. This requirement applies to all new Tentative Plans submitted on or after September 1, 2001. For inspection and testing requirements see Non-Thoroughfare Plan Roadway and Thoroughfare Plan Roadway requirements in [Appendix B](#).

II - PRODUCTS

2.01 SOIL MATERIALS

Definitions:

- A. Unstable Soil Materials: Soil that is too wet to permit proper compaction.
- B. Noncohesive Soil Materials: Noncohesive soil materials include gravels, sand gravel mixtures, and gravelly-sands.
- C. Cohesive Soil Materials: Cohesive soil materials include clayey and silty gravels, sand-clay mixtures, gravel-silt mixtures, clayey and silty sands, sand-silt mixtures, clays, silts, and very fine sands.
- D. Backfill and Fill Materials:
 - 1. Approved excavated or borrow materials must be free of rock or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, organic and other deleterious matter.
 - 2. Approved materials must be at a moisture condition suitable for compaction at required density.

III - EXECUTION

3.01 INSPECTION

Examine the areas and conditions under which excavating, filling, and grading are to be performed and remedy any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Owner.

3.02 EXCAVATION

- A. Excavation consists of removal and disposal of material encountered when establishing required trench elevations. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Owner. Unauthorized excavation, as well as remedial work directed by the Owner, shall be at the Contractor's expense.
- B. Unstable soil shall be removed to a depth determined by the Owner or Owner's representative and replaced with No. 57 stone or other approved material which may include material the Contractor stored on the job for later use and shall be uniformly and thoroughly compacted.
- C. Sheeting, Shoring and Bracing: Provide shoring, sheeting, and bracing as necessary to prevent cave-in of excavation or damage to existing structures, on or adjoining the site.
1. Establish requirements for trench shoring and bracing to comply with local codes and authorities having jurisdiction. The Contractor's attention is called to Rules and Regulations Governing the Safety and Health of Employees Engaged in Construction as adopted by the Safety and Health Codes Commission of the Commonwealth of Virginia and all latest revisions thereto and issued by the Department of Labor and Industry.

The Contractor shall perform all construction operations in accordance with the U.S. "Occupational Safety and Health Act of 1970", the Standards of the U. S. Department of Labor, Occupational Safety and Health Administration and the latest amendments thereto.
 2. Maintain sheeting, shoring and bracing in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses in accordance with proper authority.
 3. Sheeting, shoring and bracing may be left in place with the approval of the utility owner, but must be cut off to a depth not less than two (2) feet below the surface.
- D. Dewatering: Prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area.
1. Do not allow water to accumulate in excavation. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations. Dewatering shall continue until backfilling has been completed.

2. Convey groundwater and surface water removed from excavations to collecting or run-off areas approved by the Owner. Trenches shall not be used as temporary drainage ditches.
3. All dewatering shall comply with the latest edition of the Virginia Erosion and Sediment Control Handbook.

E. Stability of Excavations:

1. Slope sides of excavations to comply with local, State and Federal codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.
2. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.

F. Material Storage: Stockpile approved excavated materials where approved by County, until required for backfill or fill. Place, grade, and shape stockpiles for proper drainage.

1. Locate and retain soil materials away from edge of excavations.
2. Dispose of excess soil material and waste materials as hereinafter specified.

G. Excavation for Trenches and Structures:

1. Trenches shall be opened only so far in advance of pipe laying as the Owner will permit and in no case will this distance exceed 500 feet. Unless special circumstances dictate otherwise, all trenches must be backfilled by the end of the day. The width of the trench at and below the top of the pipe shall not exceed the outside diameter of the pipe plus eighteen inches (18") except that for pipe twelve inches (12") or less in diameter, the trench width shall not exceed thirty-three inches (33"). The trench walls above the top of the pipe may be sloped or the trench, above the top of the pipe, may be widened as necessary for bracing, sheeting and shoring. Where these trench widths are exceeded, the Contractor, at his own expense, will be required to mechanically tamp an approved backfill material from the bottom of the trench to six (6) inches above the top of the pipe as directed by the Owner.
2. Excavate trenches to the depth indicated or required. Carry the depth of trenches for piping to establish the indicated flow lines and invert elevations.

3. Grade bottom of trenches as indicated. For pressure lines, notch under pipe bells to provide solid bearing for the entire body of the pipe.
4. Where pipe for pressure lines is to be laid, the trench shall be in accordance with the County Standard Details.
5. Cold Weather Protection: Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F.
6. Excavation for structures shall conform to the lines and grades as shown, established or as necessary. Where the bottom of the excavation is in unstable material, such material shall be excavated to a depth of one foot below the bottom of the structure or to a depth required by the Owner and replaced with #57 stone, coarse sand, or other approved material. Bottoms shall be planked or covered with appropriate fabric if necessary to prevent the admixture of earth with the concrete. All sheeting, bracing, and shoring required for safety shall be installed in conformity with applicable rules and ordinances.

3.03 HARDPAN EXCAVATION

Hardpan is classified as indurated clay, shale or sand with a cementitious material, which requires loosening with an air spade or blasting before it can be removed from the trench. The same clearances shall be made between the pipe or structure and hardpan material as is described hereinafter for rock excavation.

3.04 ROCK EXCAVATION

- A. Definition: Rock excavation shall comprise solid rock in the original bed or well defined ledges and which can only be removed by blasting and/or drilling or by the use of jack hammers, and shall include all boulders or detached pieces of rock one-half cubic yard or more in content.
- B. Pipe Trench: Rock shall be excavated a minimum of six (6) inches below the bottom of all pipes. The pipes shall be laid on a cushion of No. 57 stone of sufficient depth to provide the proper grade. A minimum clearance of six (6) inches shall be provided between the vertical walls of the trench and the bell of the pipe.
- C. Structures: Rock excavation for structures shall extend a minimum of eight (8) inches below the bottom or base of structure and a suitable bedding shall be provided. A minimum clearance of six inches (6) shall be provided between the rock and the exterior face of the structure when forming is not used. The minimum clearance shall be two (2) feet when forming is used.

3.05 BLASTING

- A. Blasting operations shall be in strict accordance with "Rules and Regulations Governing Manufacture, Storage, Handling, Use and Sale of Explosives" issued by the Department of Labor and Industry of Virginia and any County ordinances. All blasting shall be done at the sole risk of the Contractor and shall be done only by experienced licensed personnel. Occupants of nearby structures shall be notified prior to beginning blasting operations.
- B. When blasting is required, the Contractor shall conform to the following requirements:
 - 1. Blasting will not be permitted before 9:00 A.M. or after 4:00 P.M. on Monday through Friday.
 - 2. Blasting on Saturdays, Sundays and holidays will not be permitted.
 - 3. The Contractor shall not be permitted to blast under any conditions unless a representative of the Owner is present.
 - 4. The Contractor shall, each day when necessary to blast, set up an approximate schedule of blasting operations, and provide 24 hours notice to the Owner, and property owners with occupied buildings within 1000 feet of blasting.
 - 5. The Contractor shall use mats to minimize noise impact on nearby residents.
 - 6. The County reserves the right to require the Contractor to have a repair crew and equipment available on-site to repair any damage caused to the Chesterfield County utility by blasting operations.
 - 7. Before any blasting can commence, a blasting survey must be conducted in order to assess the quality of residential homes within a 500 feet radius.
Additional Requirements (See Appendix G).

3.06 BACKFILL FOR TRENCHES

- A. General: After the installation of the pipe has been field inspected, the trenches shall be backfilled with fine, loose earth deposited carefully on both sides of the pipe or with the appropriate fill material as specified in the County's [Standard Details Section](#). Large clods, frozen earth, sticks, stones, and other unsatisfactory material must be excluded from the backfill around and to 12" above the pipe. The fill or in the case of plastic pipe where stone is used for bedding and backfill to the top of the pipe, the stone shall be carefully rammed by hand or pneumatic tamping methods under, on both sides and on top of the pipe. The remainder of the backfilling may be done by hand or with mechanical equipment in lifts no greater than 12 inches. Where settlement occurs, the trench shall be refilled, contoured

and compacted by an approved method to conform to the surface of the ground. Sheeting and bracing shall, in general, be removed as the backfilling progresses, and in such a manner as to avoid the caving of the trench. Voids left by the withdrawal of the sheeting or shoring shall be carefully filled and rammed. Where in the opinion of the Owner, damage is liable to result from the withdrawal of the sheeting it shall be left in place. No rock should come in contact with pipe.

1. Sewer pipe shall have minimum bedding as shown on the [County Standard Details](#).
 2. Backfill shall be compacted in layers with the following percentage of maximum density at optimum moisture content of $\pm 2\%$ as determined by ASTM D698.
 - a. 95 percent under pavements and road shoulders.
 - b. 90 percent in other unpaved areas.
- B. Under Existing Roadways and Pavement: Backfill for trenches under roadways and other paved areas shall be backfilled to the top with 21-A stone, except that all fill above the pipe shall be deposited in layers not exceeding 6 inches in thickness. Each lift shall be thoroughly compacted by mechanical or hand tamping methods, in accordance with VDOT requirements so that when the backfilling is completed, the paving may be replaced as specified in the section entitled [Construction in Public Streets, Roads and Alleys](#).
- C. Clay dams: Clay material with an imperviousness of 10-3 cm/sec shall be used in clay dams. Material shall be compacted as indicated in paragraph A above. Inspector shall approve clay material prior to use.

3.07 BACKFILL FOR STRUCTURES

Around and adjacent to structures, backfill shall be of material of suitable stability and perviousness. Backfill shall be placed in 6 inch lifts, each lift being compacted by an approved method. No backfill shall be placed against a structural wall until all connecting structural members are in place. It shall be the Contractor's responsibility to provide compaction to 95% per ASTM D-698. The Contractor shall provide adequate protection to all structures during backfilling and use every precaution to avoid damaging or defacing them.

3.08 CONSTRUCTION IN PUBLIC STREETS, ROADS AND ALLEYS

Unless superseded by other specifications or VDOT permit requirements the following shall apply: The Contractor's operations in public streets, roads or alleys, shall be confined to as small a space as is practicable, so as not to cause undue inconvenience to the public or abutting properties, and shall be subject at all times to the approval of the County and Virginia Department of Transportation (VDOT). The word VDOT used in the previous sentence means the individual, group or governmental body that has jurisdiction over the streets, roads and alleys. Unless otherwise directed by VDOT, the Contractor shall perform the proposed construction on public streets, roads and alleys as follows:

GENERAL: Typically, water and sewer lines are to cross roadways at right angles and/or to parallel roadways in the roadway or along side the roadway. Uncased water lines are to be designed to have sufficient strength to withstand dead loads and superimposed live loads. All restoration materials and workmanship shall conform to the latest edition of the "Virginia Department of Transportation Road and Bridge Specifications" in addition to permit requirements. The contractor is responsible for obtaining all highway permits and forwarding a copy to the County or obtain a VDOT statement that no highway permit is necessary before construction can begin. Method of construction (trenching, boring, tunneling, jacking, etc.) must be shown on permit and plans. During construction, if deemed necessary by the VDOT to assign inspectors to the project, the contractor is to pay an additional inspection fee to cover their cost. The contractor is responsible for identifying, locating, adjusting and/or relocating existing utilities, structures and survey markers (including making all the arrangements necessary to coordinate the work to be performed). To avoid unnecessary construction delays, the contractor needs to make application for a highway permit at least 10 working days prior to starting construction.

Nothing contained herein is intended, nor should be construed, to relieve the contractor in any manner whatsoever of his responsibility for maintaining trenches, pavement structure, shoulders and generally the work site in a manner acceptable to VDOT. Prior to the actual open cut, the VDOT is to be notified 24 hours in advance to arrange a meeting with their representative and the Utilities Inspector.

BACKFILL AND COMPACTION: Typically, backfill will be compacted to 95% of the theoretical maximum density at optimum moisture content, as determined by VDOT testing procedure VTM-1. The contractor shall provide adequate protection to all structures during trenching and backfilling using every precaution to avoid damage or defacement. Not over 500 feet of trench shall be opened at any one time. Backfill for water and sewer lines shall be placed generally in accordance with VDOT and County specifications and the following criteria:

- A. Prior to excavation of the trench and prior to the installation of surface course(s), the adjacent plant mix shall be smooth face cut through the full depth.
- B. No trench shall be backfilled until authorized by the County. Materials for backfilling from the bottom (Bedding per County Standards) of the trench to 12 inches above the water and/or sewer line shall be #57 stone bedding and backfill for sewer lines and VDOT Type B or approved sand for water lines. Material shall be thoroughly and carefully compacted to insure a sound backfill over and around the water and/or sewer line.
- C. Backfill shall be compacted by mechanical tamping throughout the depth of the trench in 6" layers to insure a suitable subbase, acceptable to the County and VDOT.

- D. Backfilling shall be performed in accordance with the standard details, latest revision, for pavement restoration applicable to the situation at hand.

BITUMINOUS PAVEMENT STRUCTURE: Wherever pavement is permitted to be cut as shown on plans, not over one-half of the road width shall be disturbed at one time, unless an approved method of detouring traffic is reviewed and accepted by Virginia Department of Transportation. The first opening shall be in travelable condition before the second half can be opened.

Where contractor is granted approval from VDOT to open cut a road, **(this applies to crossings only)** the permit will include the following stipulations but not limited thereto:

- A. Chesterfield Residency is to be notified 48 hours prior to any open cut work being performed.
- B. Work within the roadway shall be done between the hours of **9 A.M. and 4 P.M.** or as stated in the VDOT permit.
- C. Utilize proper sign layout and channelization devices (i.e., cones, plastic barrels, pavement marking, etc.) during construction, according to VDOT's "Virginia Work Area Protection Manual".
- D. The area of the open cut shall be restored in accordance with one of the following applicable standards:
 - 1. **Asphalt Road**
 - a. Backfill entirely with #21-A or #21 stone (95% compaction)
 - b. Apply tack material to all joints, before placing surface mixture
 - c. Install minimum 12" BM-25.0 asphalt concrete in 4" lifts (see Standard Detail)
 - d. Overlay a minimum of 25' on both sides of trench with 2" of surface mix
 - e. Seal all joints with liquid bituminous sealer
 - 2. **Asphalt Road Base with a Surface Treatment Seal**
 - a. Backfill entirely with #21-A or #21-B stone (95% compaction)
 - b. Apply tack coat for all edges and existing surface asphalt (see Standard Detail)

- c. Install 1.5 times the thickness of existing pavement or a minimum of 6" BM-2 (base mix) flush with existing pavement
- d. Surface treat a minimum of 10' on both sides of trench with blotted seal coat type C: the initial seal and final seal shall conform to the requirements of AASHTO M208 @ 0.17 gals./sq. yd. with 15 lbs. of No. 8P stone/sq. yd. each.

3. Surface Treated Road (Tar and Gravel)

- a. Backfill entirely with #21-A or #21-B stone (95% compaction)
- b. Apply tack coat for all edges and existing surface asphalt (see Standard Detail)
- c. Install 4" of BM-2 (base mix) in trench flush with existing pavement
- d. Surface treat a minimum of 10' on both sides of trench with blotted seal coat type C: the initial seal and final seal shall conform to the requirements of AASHTO M208 @ 0.17 gals./sq. yd. with 15 lbs. of No. 8P stone/sq. yd. each.

4. Dirt/Gravel Road or Aggregate Shoulders

- a. Select backfill compacted to 95% maximum density (6" lifts)
- b. Backfill trench with 10" of #21-A or #21-B stone (95% compaction)
- c. Apply fresh application of #21-A or #21-B stone to all disturbed areas of the road

E . The pavement cut shall be covered with a temporary or permanent asphalt patch on the same day that excavation is made.

F. One travel lane will be maintained at all times.

Where the contractor is granted approval to open cut the road for parallel installation within the pavement and service crossings, pavement replacement shall be in accordance with the PAV Details as reflected in Part II of this document and VDOT permit.

Placement of all plant mix and surface treated courses shall be rolled where possible with a unit having a manufacturer's rating of 10 tons, and rolled until the aggregate is keyed into the bitumen. Where rolling is not possible, a mechanical tamp will be used. The stone is to be placed in the trench daily up to 1,500 feet at which time the pavement shall be covered with a temporary or permanent asphalt patch. If the application of the bituminous layer is delayed for adverse weather conditions, the contractor shall provide and maintain a base course that is acceptable to both the Virginia Department of Transportation and the Utilities Department of Chesterfield County until such time as the appropriate pavement patch can be applied and accepted.

Upon completion of the installation of the water and sewer lines (not necessarily all testing completed), contractor shall restore pavement in the manner prescribed on the Virginia Department of Highways and Transportation permit or appropriate agency within ten (10) days. All trenches and repaving shall be maintained in accordance with the VDOT permit, and shall be repaired upon request of VDOT. Maintenance period shall start with VDOT acceptance of work in right-of-way.

SITE MAINTENANCE AND RESTORATION: Road connections and private entrances are to be kept in a satisfactory condition. Entrances are not to be blocked and sufficient provisions made for safe travel to adjacent property at all times. When entrances are disturbed, they must be restored to original condition or to a condition satisfactory to the VDOT's Resident Engineer or property owner. Road drainage is not to be blocked. The pavement, shoulders, ditches, general roadside and drainage facilities shall be left in as good condition as found (consistent with adjoining sections of the highway), maintained in a satisfactory condition and establish positive drainage in the ditches. All loose material shall be swept from hard surface immediately after backfilling. Calcium Chloride before sweeping or approved alternate shall be used to settle dust whenever necessary. Concrete walks and curbs shall be replaced in entire sections. During rainy periods all trenches shall be watched closely for settlement. If emergency situation arises under any circumstances, repairs will be made at the Contractor's expense. The contractor shall maintain all trenches and damaged pavement in a manner acceptable to VDOT's Resident Engineer. Additionally, after paving is complete, the contractor shall be responsible for any settlement of trenches requiring additional fill, pavement or other corrective measures until the permit or road is accepted (this includes future State roads currently developer owned). Upon completion of the work under permit, the contractor will notify the Resident Engineer so an inspection can be made to insure compliance with the highway permit, and accepted by VDOT. Where landscaped areas are disturbed, the area shall be left with a minimum of 2" or better of topsoil and reseeded according to VDOT Specifications, this shall include reseeded until a stand of grass is obtained.

WORK ZONE PROTECTION: The contractor shall immediately correct any situation which may arise as a result of construction that VDOT or County deem hazardous to the traveling public, even though it may not be specifically covered in the highway permit or other requirements. In the event that these conditions are not complied with, and after reasonable notice has been given by VDOT, it is hereby agreed and understood that VDOT reserves the right to employ an outside Contractor to perform the necessary work and bill the firm doing the work. The word "firm" used in the previous sentence means the individual, corporation, or partnership in whose name the permit was issued.

Traffic is not to be blocked, rerouted or otherwise impeded without written permission from the Resident Engineer. Placement and type of traffic control, warning devices and personnel shall be in accordance with VDOT "Work Area Protection Manual". Where one way traffic is permitted, contractor shall perform proper flagging for the duration of the project. The contractor will notify VDOT at least 24 hours before starting work. If traffic is impeded in any way, the same notice must be given to Fire Department, Rescue Squad, VDOT, Police Department and School Board. All open trenches, pits, etc. shall be secured with barricades and any other necessary equipment to protect the public. The State of Virginia and Chesterfield County shall not be liable for any damage resulting from construction.

3.09 DISPOSAL OF WASTE MATERIALS

- A. Removal from Project Site: Remove waste materials, including unacceptable excavated material, trash, and debris, and dispose of it legally off the project site.
- B. Dust Control: Water, calcium chloride or approved alternate shall be periodically sprinkled to alleviate problems associated with dust.
- C. Disposal of asbestos cement pipe shall be done in accordance with AWWA Manual 16, "Work Practices for Asbestos Cement Pipe".

End of Section

SECTION 5

WATER DISTRIBUTION SYSTEM

I - GENERAL

1.01 RELATED DOCUMENTS

The general provisions of the Contract, including General and Supplementary Conditions and General Requirements apply to the work specified in this Section. Work accomplished under this Section shall be in accordance with the County standard details ([Part II of this document](#)).

1.02 DESCRIPTION OF WORK

- A. Contractor shall provide all labor, equipment, tools, services, and materials necessary for, or incidental to, the construction of the water distribution system, in conformance with, but not limited to, the following:
1. All trenching, excavation, backfilling as stated herein or shown on the drawings.
 2. Setting new pipe inverts and other appurtenances to the proper location and invert elevations as shown on the Plans or approved cut sheets.
 3. Testing all utility piping systems as applicable and stated herein.
 4. In general all proposed utility systems as covered in this Section will be installed in the confines of the site as noted on the Plans.
- B. Related Work Specified Elsewhere: Site clearing, trenching, backfilling, and compaction.

1.03 REQUIREMENTS OF REGULATORY AGENCIES

Construction as shown on the Plans or stated herein shall be performed in accordance with current and applicable requirements as established by the County of Chesterfield, the Virginia Department of Health, or any other agencies having jurisdiction. Where conflicts arise between the Contract Documents and previously mentioned requirements, the more restrictive shall apply. If such requirements shall require a change in the work as stated herein or shown on the plans, the Contractor shall stop work and notify the Owner for further direction.

II - PRODUCTS

2.01 APPROVED MATERIALS

All materials shall conform to the County of Chesterfield "[Approved Materials and Manufacturers](#)" list with latest revision date. Contractor shall follow guidelines as established in the [General Conditions](#) of this document under [Shop Drawings](#). All materials shall be virgin material.

III - EXECUTION

3.01 INSTALLATION OF NEW WATER SYSTEMS

A. Excavating and Backfilling:

1. Contractor shall do all excavating of any and all materials encountered in the course of excavating for all underground utility systems. After the pipe is in place, backfill with suitable material free from frozen earth, rocks, organic material, etc.
 - a. Provide all necessary shoring required for the protection of excavations, existing utilities and workmen and do all necessary pumping required to keep excavation and pipe free of water from any source at all times.
 - b. Provide sufficient barricades, etc., adjacent to excavations to safeguard against injury to workmen and the public. Provide and maintain sufficient warning lanterns at walks, roadways, and parking areas to provide safety at all times.
 - c. Where roots of live trees are encountered in excavations, they shall be carefully protected during construction.
 - d. Exercise special care in backfilling trenches to guard against disturbing the joint.
 - e. Remove and dispose of any material not used for backfill.
2. Removal of subsurface obstructions which are uncovered during excavation for installation of the water systems shall be removed by the Contractor at his expense. This shall include removal of existing concrete or brick of existing building foundations, footings, abandoned utility piping, wires, structures, rock boulders, etc., which may not be visible from surface investigations before construction, but will interfere with new installations. If such obstructions are encountered they shall be removed two feet from around the area of new facility and backfilled with a suitable material as specified.

B. Pipe Installation:

1. Take all precautions to insure that pipe and related items are not damaged in unloading, handling and placing in trench. Examine each piece of material just prior to installation to determine that no damage has occurred. Remove any damaged material from the site and replace with undamaged materials.

2. Keep pipe clean. Exercise care to keep foreign material and dirt from entering pipe during storage, handling and placing in trench. Contractor shall be responsible for plugging or capping line at the end of each day.
3. Do not lay pipe when weather or trench conditions are unsuitable.
4. Line and grade hubs shall be set by a registered surveyor at intervals to accurately insure proper location of water line and appurtenances. This shall include finished grade centerline stakes for fire hydrants, stakes at all fittings, referencing all property pins, etc. Cut sheets are required where the water line is to be laid to a grade according to the profiles in the plans, or where the future road grade is not yet to within 6" of its final location.
5. Water Pipe Laying:
 - a. Laying of water pipe shall be accomplished only after the trench has been dewatered and the foundation and/or bedding has been prepared. Mud, silt, gravel, and other foreign material shall be kept out of the pipe and off the jointing surfaces.
 - b. All pipe laid shall be retained in position so as to maintain alignment and joint closure until sufficient backfill has been completed to adequately hold the pipe in place. All pipe shall be laid to conform to the prescribed line and grade shown on the plans and this shall include digging out for bell ends.
 - c. Water pipe runs intended to be laid straight shall be so laid. Deflection from a straight line may be made by deflecting the joints only when permission has been given by the Engineer or Inspector. Joint deflection shall not exceed one-half that recommended by AWWA Standards or the manufacturer whichever is less. Changes in grade or alignment which cannot be made by deflecting pipe joints shall be made by use of proper bends, offsets or special fittings as required.
 - d. The water pipe, unless otherwise approved by the Owner, shall be laid up grade from point of connection of the existing water line or from a designated starting point. Water pipe shall be installed with the bell end forward or upgrade. When pipe laying is not in progress the forward end of the pipe shall be kept tightly closed with a water tight plug or cap, plywood or plastic is not acceptable.

- e. The pipe shall be fitted and matched so that when laid in the work, units will form a smooth, uniform invert.
- f. Prior to joining the pipe, all surfaces of the pipe to be joined and the surfaces of factory made jointing materials shall be clean and dry. Approved lubricants, primers, adhesives, etc., shall be applied and the pipes joined as recommended by the manufacturer's specifications. Sufficient pressure shall be applied in making the joint to assure that the pipe is "home". The interior of the pipe shall be cleaned of all foreign material as the work progresses. At the end of the work day, the last pipe laid shall be blocked to prevent creep, and closed with a water tight plug or cap.
- g. Joining Pipe:
 - 1) Ductile iron pipe to be joined as follows:
 - a) Mechanical joint pipe
 - (1) When installing PVC pipe into M.J. fittings, the beveled end of the pipe must be cut off to allow for maximum insertion depth and sealing area to avoid leaks. An approved joint restraint device is required when inserting PVC into MJ fittings. This device does not replace the requirements for a joint restraint system. Thoroughly clean inside of the bell and 8 inches of the outside of the spigot end of the joining pipe to remove oil, grit, excess coating and other foreign matter from the joint. Lubricate the bell and spigot end of the pipe, using only approved lubricant (Blue Lube or Slikstyx). (Note: Use of any unapproved lubricant other than Blue Lube or Slikstyx has been shown to cause significant taste and odor conditions when used in drinking water disinfected with chloramines. The County will not accept completed water lines that exhibit taste and odor conditions as a result of the use of unapproved lubricants.) Slip cast-iron gland on spigot end with lip extension of gland toward end of pipe. Lubricate rubber gasket

with approved lubricant referenced above and place on the spigot end with thick edge toward the gland.

- (2) Push the spigot end forward to seat in the bell. Then carefully press the gasket into the bell so that is located evenly around the joint. The gland is moved into position, bolts inserted and nuts screwed on finger tight, then tighten all nuts to torque listed below.

Bolts Size Inches	Torque-Ft.Lbs.		
5/8	40	-	60
3/4	60	-	90
1	70	-	100
1 1/4	90	-	120

- (3) Tighten nuts on alternate sides of the gland until pressure on the gland is equally distributed and torque value is reached.
- (4) Permissible deflection in mechanical joint pipe shall not be greater than one-half the maximum amount allowed in AWWA C600.

b) Push-on joint Ductile Iron pipe

- (1) Thoroughly clean inside of the bell and 8 inches of the outside of the spigot end of the joining pipe to remove oil, grit, excess coating, and other foreign matter. Flex rubber gasket and insert in the gasket recess of the bell socket. Apply a thin film of approved gasket lubricant (Blue Lube or Slikstyx), to the gasket and the spigot end of the joining pipe. (Note: Use of any unapproved lubricant other than Blue Lube or Slikstyx has been shown to cause significant taste and odor conditions when used in drinking water disinfected with chloramines. The County will not accept completed water lines that exhibit taste and odor conditions as a result of the use of unapproved lubricants.)
- (2) Start spigot end of pipe into socket with care. The joint shall

then be completed by forcing the plain end to the bottom of the socket with a forked tool or jack type device. Field cut pipe shall have the end filed to match the manufactured spigot end.

- (3) Permissible deflection in push-on joint pipe shall not be greater than 1/2 of that listed in AWWA C600.

- 2) Polyvinyl chloride (PVC) pipe shall be joined in accordance with the manufacturer's recommendations.

Polyvinyl Chloride (PVC) Push-on Joint Pipe

- a) Thoroughly clean inside of the bell and 1" beyond the reference mark on the spigot end of the joining pipe. Make certain the ell and rubber gasket have no foreign material that could interfere with the proper assembly of the pipe spigot.
 - b) Lubricate the gasket and spigot end of the pipe, using only approved lubricant (Blue Lube or Slikstyx). (Note: Use of any unapproved lubricant other than Blue Lube or Slikstyx has been shown to cause significant taste and odor conditions when used in drinking water disinfected with chloramines. The County will not accept completed water lines that exhibit taste and odor conditions as a result of the use of unapproved lubricants.)
 - c) Insert the spigot end into the bell. Align the pipe sections and push the spigot end in until the reference mark on the spigot end is flush with the end of the bell. Use a bar and block of wood to push pipe home.
 - d) Field cut pipe shall be square cut and beveled to insure proper assembly. Use a factory finished beveled end as a guide to produce an equivalent angle and length of taper.
- 3) Asbestos Cement Transition:
 - a) When connecting PVC or Ductile Iron pipe to existing asbestos cement pipe, the transition coupling is to be applied to the rough barrel of the

asbestos cement pipe and not to a factory or machined end of the asbestos cement pipe.

- h. A tracing wire of 14 gauge copper shall be installed and taped directly on top of the pipe in a manner that a continuous tract results. Wire is to be wrapped around hydrants, blow offs and corporation stops.
- i. Place underground warning tape directly above all water mains, 18" below finished grade. Tape shall be polyethylene tape with a metallic core, 2 inches in width, with the continuous printed message "Caution Waterline Buried Below." Tape shall be Catalog No. 2 WAT as manufactured by the Seton Name Plate Corp. or approved equal.
- j. In addition to letter h and i of this section above, all lengths of pipe within a joint restraint system shall have a marker tape (BLUE with text: "Water Restrained Joints") attached directly to the top of the pipe with duct tape.

C. Installation of Valves, Fittings, and Hydrants:

- 1. General: Valves, fittings and hydrants shall be set and jointed to the piping system as hereinbefore specified for cleaning, laying and jointing pipe.
- 2. Valves and Valve Boxes: Cast iron valve boxes shall be firmly supported, centered and plumb over the operating unit of valve. Box cover shall be set flush with the surface of finished pavement or at such other level as may be directed by the Owner. Valve rod extension with guide shall be required to maintain a distance of 2'-4' from operating nut to top of box. All valves shall be properly restrained.
- 3. Valve Key Extensions: Valve stem extensions shall be required where the valve-operating nut is installed at a depth greater than four feet (4').
- 4. Cross Connections: Drainage branches or blowoffs shall not be connected to any sewer, submerged in any stream or installed in any manner which, in the opinion of the Owner, will constitute a contamination hazard, or cross connection.
- 5. Hydrants: Connection to Main: Each hydrant shall be restrained and connected to the main with a minimum 6 inch branch, controlled by an independent 6 inch gate or resilient seat valve. Setting of Hydrants: When hydrants are set, a drainage pit two feet in diameter and two feet below the bowl of the hydrant shall be excavated. Valves: All valves shall be restrained with a hydrant tee.

The pit shall be filled with coarse gravel or #57 clean stone, mixed with coarse sand, to a level of 6 inches above the weep hole. No hydrant drainage pit shall be connected to a sewer. The bowls of all hydrants shall be well braced against unexcavated earth with suitable concrete backing, and when directed shall be restrained to the pipe with approved harnessing. All hydrants shall be thoroughly cleaned of dirt or foreign matter before setting.

6. Anchorage of Fittings: As required in Part V, Section 4 of this document, all fittings i.e., each bend, tee, plug, valve and cap shall be prevented from moving by means of adequate thrust reaction blocking or mechanical restraints; or both.
7. In easements and undeveloped wooded areas, plastic markers shall be installed every 200 feet, and at all valves and fittings. Markers shall be as manufactured by Carsonite or approved equal. Exceptions are where water lines are installed in "kept" yards where the property owners may object to the placement of these markers. Contractors will be required to properly install the markers per manufacturer's recommendations, parallel to the water line facing roadway, or as additionally directed by the County.

D. Installation of Fabricated Steel Tapping Sleeves:

1. General: Rigorous testing and conditions relating to tapping sleeves, applied to all manufacturers, will become our standard operating procedure. These conditions are as follows:
 - a. The tapping sleeve shall be tested in place to a minimum of 200 psi, for a minimum of 10 minutes with no loss of pressure.
 - b. If the sleeve fails the 200 psi pressure test, the original failed sleeve shall be replaced with an entirely new sleeve.
 - c. Tapping sleeves 16" and above shall be supported by a concrete pedestal support, as shown in the County's "Standard Details" Section.
2. Installation: In addition to the conditions outlined in Section 1 above, the following procedures must be adhered to be followed by the contractor:
 - a. Clean pipe surface thoroughly, particularly in the area where the gasket will seal. The contractor shall wipe the pipe in the area where the tap is to be made with a 1% chlorine solution prior to installing the sleeve.

- b. Lubricate pipe and gasket with soap and water or gasket lubricating solution. Do not use grease or pipe lubricant.

Under no condition should any antifreeze be used.

- c. Mount body halves on pipe. Contractor shall ensure gasket is secure in gasket groove.

Contractor shall ensure that the tapping nipple is pointing in its final direction so it will not be moved or rotated on the pipe. This half of the sleeve can be blocked in some fashion so the back half of the sleeve and bolts can be installed without having to have several people involved in attaching the sleeve.

- d. Insert bolts and hand tighten nuts, keeping equal gaps between body halves.
- e. Prior to tightening nuts, position outlet as required to suit the installation. Contractor should ensure test connection is accessible.
- f. Tighten bolts, alternating from one side to the other to equalize the gap between halves. Continue to tighten bolts until sleeve halves conform to the contour of the pipe and all bolts are to a uniform tightness. Torque bolts per manufacturer's recommendations. On thin wall or badly corroded pipe care should be taken to prevent crushing or collapsing of the pipe.
- g. A pressure test is required prior to tapping to test the sleeve and valve in place.

Prior to pressure testing, the inspector shall obtain a reading of line pressure in the system, either from a hydrant or a service. The pressure test should be at 2 ½ times line pressure or 200 psi, whichever is greater. The duration of this pressure test shall be a minimum of ten minutes. If the sleeve fails the pressure test, it shall be completely removed and returned and a new sleeve used. The tapping sleeve, valve and tapping machine assembly is to be adequately supported furring the tapping operation to prevent movement or rotation of the tapping sleeve.

- h. Proceed with tapping operation.

Contractor shall complete tapping procedures and do necessary checking as required. Contractor shall furnish the inspector with the coupon.

- i. Check the bolts for tightness and retorque if required.

E. Installation of Services:

1. 3/4" and 1"

- a. Taps on PVC Pipe shall be made with service saddles (from approved list)
- b. Taps shall be made on a 45° angle
- c. Corporation stops shall have "cc" thread inlet and copper flare outlet
- d. Tap shall be made with a tapping machine equipped with a bit designed for the type of pipe being tapped
- e. Distance between taps or from a joint or bell shall be a minimum of 18"
- f. Service pipe shall be type "K" soft copper
- g. Services shall be installed with 3'6" minimum cover up to meter yoke where yoke shall be installed so that meter will set 12" -16" from finished grade
- h. Meter yokes shall be from approved materials list and be installed with a tail piece of type "K" copper 10" - 18" long
- i. Meter yoke and box shall be set 1' inside property line or a reasonable distance inside property line in order to install on reasonable level ground
- j. Backfill shall be hand tamped up to service pipe at tap to prevent corporation stop from being broken off during backfilling
- k. Traffic box to be of cast iron in driveways

2. 1½ and 2" Services:

- a. All taps for 1½" and 2" services shall be made with service saddles (from approved materials list)
- b. Taps shall be made at the spring line of the pipe
- c. Corporation stops shall have "cc" thread inlet and copper flare outlet

- d. Tap shall be made with a tapping machine equipped with a bit designed for the type of pipe being tapped
- e. Distance between taps or from a joint or bell shall be a minimum of 18"
- f. Service pipe shall be type "K" hard copper
- g. Services shall be installed with 3'6" minimum cover up to meter yoke where yoke shall be installed so that meter will set 12" -16" from finished grade
- h. Meter yokes shall be from approved materials list and be installed with a tail piece of type "K" copper 10" - 18" long
- i. Meter yoke and box shall be set 1' inside property line or a reasonable distance inside property line in order to install on reasonably level ground
- j. On 1½" and 2" services a curb stop shall be installed on inlet side of yoke, 1' from yoke
- k. Backfill shall be hand tamped up to service pipe at tap to prevent corporation stop from being broken off during backfilling

F. Installation of Water Mains and Water Meter Boxes as it relates to Sidewalks:

- 1. Sidewalks must be constructed to accommodate at least a 4 foot horizontal separation between the County's public water mains.
- 2. If sidewalks are constructed within the public road right-of-way, the street side of all water meter boxes must be installed 3 feet behind the house side of the sidewalk or to the right-of-way line, whichever is greater.
- 3. If sidewalks are constructed outside of the public right-of-way and are less than 5 feet from the right-of-way line, the street side of all water meter boxes must be installed 3 feet behind the house side of the sidewalk.
- 4. If the sidewalks are constructed outside of the public right-of-way and are more than 5 feet from the right-of-way line, the water services must be installed within 1 foot outside of the right-of-way line.

3.02 TESTING OF WATER DISTRIBUTION SYSTEM

A. Testing Techniques for Water Distribution System:

1. Each properly isolated section of the piping system including all water services shall be subjected to a pressure test of 150 psi or $1\frac{1}{2}$ times the working pressure, whichever is greater, measured at the high point of the system. Maintain this pressure for a minimum of two hours with an allowable leakage as reflected in the Standard Details Section, Part II. Prior to applying pressure to the lines all reaction blocking, and/or mechanical restraint shall have been completed to the satisfaction of the Engineer or Inspector. As the pipes are being filled, all air shall be expelled from the pipes by providing suitable taps at the high points of the system. After the system is filled, all taps shall be tightly plugged. Any defects discovered during this test shall be corrected as directed and the test shall be repeated until the results are satisfactory. The Contractor shall provide all equipment and materials and perform all labor necessary to conduct the test in the prescribed manner. The Contractor shall provide a suitable test pump and properly calibrated gauge or other means for measuring leakage to include, a clean 50 gallon barrel with top cut out which is satisfactory to the Engineer or Inspector.
2. The Owner will furnish water for flushing, sterilization and testing without charge. Filling of water line may be performed provided permission has been obtained from the Inspector who will be responsible for coordinating this activity with the County's Operations and Maintenance Section. Contractor is not permitted to operate valves on existing lines.
3. Testing shall be performed in accordance with the AWWA Specifications, latest edition.

3.03 DISINFECTION

- #### A.
- Prior to being placed in service, the pipe line and appurtenances shall be disinfected in general accordance with ANSI/AWWA C651- 92; AWWA Standard for **Disinfecting Water Mains** and the supplemental procedures as set forth below.
1. Section 3 of AWWA C651-92 emphasizes six basic procedures in the disinfection process. The procedures are to:
 - a. prevent contaminating materials from entering the water main during storage, construction, or repair;

- b. remove, by flushing or other means, those materials that may have entered the water main;
- c. chlorinate any residual contamination that may remain, and flush the chlorinated water from the main;
- d. protect the existing distribution system from backflow due to hydrostatic pressure test and disinfection procedures;
- e. determine the bacteriological quality by laboratory test after disinfection; and
- f. make final connection of the approved new water main to the active distribution system.

2. Preliminary Flushing:

The main shall be flushed prior to disinfection at a velocity of not less than 2.5 Ft./Sec. unless the owner determines that conditions will not permit the required flow. See Table 1, entitled "Flushing Schedule". Adequate provisions shall be made by the contractor for disposal of flushing water so that no physical or environmental damage results. Contractor will find additional instructions on flushing in the supplemental procedures within this section.

3. Forms of Chlorine for Disinfection:

It is the contractor's responsibility to be familiar with and have available for his employees the "Product Data Safety Sheets" of any products used as a source of chlorine and to provide the proper safety instructions and personal protective equipment to the employees mixing and using materials for disinfection of the water facilities.

- a. Acceptable sources of chlorine for disinfection may be obtained from any of the following three sources:
 - 1) Liquid sodium hypochlorite (household bleach)
 - 2) Liquid sodium hypochlorite (industrial strength)
 - 3) Calcium hypochlorite granules

- b. Only under extreme conditions and with the written approval of the Owner and under the direction of a holder of a State of Virginia Class III (or higher) water works operator's license can chlorine gas, regulated through proper metering equipment, be mixed with water to obtain a suitable disinfecting solution.
- c. The direct introduction of chlorine gas (or liquid) from a pressure cylinder into a water line is not safe and shall not be allowed.
- d. The use of calcium hypochlorite pills affixed to the interior of water pipe for disinfection shall not be an acceptable form of disinfection.
- e. The mixing of a source of chlorine to obtain a suitable disinfecting solution shall be as follows:
 - 1) Liquid sodium hypochlorite is supplied in strengths from 5.25 percent available chlorine (commercially available household bleach) to 15 percent available chlorine (industrial strength sodium hypochlorite). A water-sodium hypochlorite solution shall be prepared by adding liquid sodium hypochlorite to water.
 - 2) A water calcium hypochlorite solution shall be prepared by dissolving calcium hypochlorite granules containing 65% available chlorine by weight in a pre-determined volume of water to make the desired water-calcium hypochlorite concentration. Disinfection of new mains by water calcium hypochlorite solution shall not be used unless a suction or in-line strainer is available on the solution pump to prevent any undissolved solids from entering the piping. An alternative method of straining the solution to remove undissolved granules may be approved by the inspector on a case by case basis.
 - 3) A water-chlorine gas solution may be used only when suitable equipment is available and shall be done under the direct supervision of a person familiar with the physiological, chemical, and physical properties of this element and who has a State of Virginia Class III or above water works operator's license and is properly trained and equipped to handle any emergency that may arise.

- 4) The direct introduction of chlorine gas (or liquid) from a pressure cylinder into a water line is not safe and shall not be allowed.

4. Method of Chlorine Application and Testing:

- a. The continuous feed method of applying the disinfecting solution shall be as follows: Water from the existing distribution system or other approved sources of potable water supply shall flow through an approved flushing mechanism (Standard Detail WAT-6) at a constant, measured rate into the newly-laid pipeline. The water shall be mixed with a chlorine-water solution as prepared above, also fed at a constant, measured rate. The two rates shall be proportioned so that the chlorine concentration of the water and water/chlorine solution in the pipe is elevated to and maintained at, a minimum of 50 mg/l available chlorine.

Since the forms of preparation for a water sodium hypochlorite or water calcium hypochlorite concentration are a batch process, a method acceptable to the inspector shall be available to replenish the concentration being fed and mixed with the water flow, so there is no interruption of the flow of disinfection solution.

To assure that this concentration is maintained, the chlorine residual shall be measured at intervals not exceeding 2,000 feet and at the end of all branch lines or cul-de-sacs in accordance with the procedures outlined herein. During the application of the chlorine-water solution, valves, hydrants and any other appurtenances shall be operated in order to be thoroughly disinfected. Chlorine-water solution application shall continue until the entire new main is filled with water having a residual of a minimum of 50 mg/l chlorine solution. The chlorinated water shall be retained in the main for at least 24 hours.

- b. The Owner will furnish the personnel and equipment for determining water-chlorine solution strengths and residuals.
- c. After the applicable retention period, the heavily chlorinated water shall be flushed from the main until the chlorine residual of the water leaving the main is equal to the chlorine residual of the incoming system water. At that time, the new system shall be valued off and bacteriological testing shall begin as indicated

in Section 3.03.B. Additional instructions for disposal of the heavily chlorinated water is covered in Section 3.04.E, entitled "Flushing".

B. Bacteriological Tests:

1. After final flushing, and before the water main is placed in service, samples shall be collected and tested for bacteriological quality as follows:
 - a. If total chlorine is 1.5 mg/L or less: Begin bacteriological testing at 24 hours after final flush.
 - 1) Test for total and fecal coliform for 2 consecutive days. Both test samples must be less than 1 colony/100 ml.
 - 2) Test for heterotrophic plate count on 2nd day. Test sample must be less than 500 colonies/ml.
 - b. If total chlorine is greater than 1.5 mg/l: Wait 5 days or until residual drops to 1.5 mg/l or less, whichever is sooner, then test.
 - 1) Test for total and fecal coliform for 2 consecutive days. Both test samples must be less than 1 colony/100 ml.
 - 2) Test for heterotrophic plate count on 2nd day. Test sample must be less than 500 colonies/ml.

Samples shall be collected at least 24 hours apart at intervals determined by the Inspector (not exceeding 2,000 feet apart and at the end of all branch lines and cul-de-sacs) and tested by the County of Chesterfield laboratory and the results submitted to the Owner.
2. Samples for bacteriological analysis shall be collected in approved sterile bottles or bags treated with sodium thiosulfate provided by the County laboratory. If laboratory results indicate the presence of coliform bacteria, the samples are unsatisfactory and disinfection shall be repeated as prescribed above until the samples are satisfactory. Cleaning, disinfection and testing shall be under the direction of the Inspector but remains the responsibility of the Contractor. Water for these operations will be furnished by the Owner, but the Contractor shall be responsible for any cost associated with the loading, hauling, and discharging of the heavily chlorinated water.

3.04 SUPPLEMENTAL PROCEDURES FOR DISINFECTING, TESTING, AND FLUSHING

A. GENERAL:

1. All work shall be performed in general accordance with AWWA C651-92.
2. The supplemental procedures are developed to compliment the AWWA C651-92 Standard, particularly with respect to flushing, testing and tie-in to the existing water distribution system.
3. These procedures and construction acceptance for final tie-in of a new water main are performance based, predicated on the new construction passing pressure and bacteriological testing. In order to best assure satisfactory bacteriological results, it is essential that all aforementioned preventive and precautionary measures be taken prior to and during construction to protect the interiors of pipe, fittings and valves against contamination. Failure to follow the precautionary measures increases the likelihood of unsatisfactory bacteriological tests and increases the construction requirements necessary for final acceptance. Refer to AWWA C651-92, Section 4, entitled "Preventive and Corrective Measures During Construction".
4. No contaminated material or any material capable of supporting the growth of microorganisms or causing taste, odor, or other aesthetic water quality concerns shall be used in sealing joints. Sealing material or gaskets shall be handled in a manner that avoids contamination. The lubricant used in the installation or sealing gaskets shall be Blue Lube or Slikstyx pipe gasket lubricant. Blue Lube and Slikstyx are the only pipe joint lubricant for such use. It shall be kept clean and applied clean with dedicated applicators. (Note: Use of any unapproved lubricant other than Blue Lube or Slikstyx has been shown to cause significant taste and odor conditions when used in drinking water disinfected with chloramines. The County will not accept completed water lines that exhibit taste and odor conditions as a result of the use of unapproved lubricants.)
5. Table 1, Flushing Schedule gives flushing flow rates and flushing mechanism sizes for water mains 6" through 24" in diameter. Specific flushing schedules for line sizes above 24" will be project and site specific and directions will be given on the project drawings.

B. Filling and Testing Procedures:

1. Connection of the new water main to the existing distribution system for filling and testing shall be through a contractor furnished flushing mechanism as shown on Standard Detail WAT-6 of these specifications and sized as noted in Table 1, entitled "Flushing Schedule". The contractor is to furnish the single gate valve, double check valve flushing assembly and all necessary fittings, reducers, increases and sleeves to make the piping connections. A suitable valued piping arrangement for the additions of the water-chlorine solution is to be available on the new line side of the flushing assembly. The assembly is to be furnished with 125 psi rated flange connections and installed in a manner approved by the Inspector.
2. Initial flush time is to be in accordance with Table 1, entitled "Flushing Schedule".
3. Pressure test the line as noted in Section 3.02, A.1 of these specifications.
4. Make any necessary repairs and pressure test again until the line passes this test.
5. Disinfect the line in accordance with AWWA C651-92, Section 5. A water-chlorine solution prepared in accordance with Section 3.03 A.3 above shall be used for disinfection.
6. Bacteriological samples will be taken by the County in accordance with AWWA C651-92, Section 7.
7. If unsatisfactory bacteriological test results are received, repeat steps 2, 5 and 6. Where only an unsatisfactory heterotrophic plate count is received, steps 2 and 6 need only be repeated at existing residuals.
8. After receiving satisfactory bacteriological test results, the contractor shall coordinate with the Inspector the connecting of the new main to the existing system. All connecting pipe and fittings shall be clean and free of debris and shall be swabbed or sprayed with a 1 percent sodium hypochlorite solution before they are installed. The contractor shall tie-in new water lines to the existing water system within 10 working days of successful completion of all bacteriological tests, otherwise the disinfection process must be repeated.
9. Final flush of line to be in accordance with Table 1, entitled "Flushing Schedule".

C. The Disinfection and Supplemental Procedures as covered in sections 3.03 and 3.04 may be modified by the Director of Utilities for site specific problems that do not physically allow for following the normal disinfection procedures. Modified instructions will be given in writing from the Director through the Inspector and will be executed by the Contractor in a manner that does not subject the existing distribution system to undue problems and assures that adequate disinfection and flushing will be given to the new main.

D. The procedure for the disinfection of short leads to fire hydrants and the connector pipe to fire suppression systems/ double check assemblies shall be as follows:

Connector piping, fittings and valves from an existing main to a fire hydrant or to a fire system double check assembly, which does not contain domestic use branches and is equal to or less than eighteen (18) feet in length from the main, may be spray disinfected or swabbed with a minimum 1 percent solution of chlorine just prior to installation, tied-in and flushed at a velocity of not less than 2.5 ft/sec. Bacteriological sampling will be taken downstream for confirmation.

E. Flushing:

Water for filling the line and flushing will be supplied by the Owner at no cost to the Contractor. Therefore, the use of water for making the new water line available for service will be as follows:

1. Initial Flush:

See Table 1, entitled "Flushing Schedule". This is to be a high velocity flush through all sections of the new line. Since the large volume of water may have effects on the existing distribution system, the initial flushing is to be done only with the approval of and under the direction of the Inspector. System demands may cause this flushing to be done at times when the existing distribution system demands are low.

Because of the large volume of water to be flushed from the fire hydrants or flushing hydrants, the Contractor must inspect the areas of discharge and provide the necessary equipment or materials to prevent any environmental damage or erosion. Sufficient hose length and termination fittings are to be provided so as to discharge the water into stable, heavily vegetated areas, drainage ponds, storm sewers, paved ditches, etc. The contractor is to be responsible for any damage that may result from flushing.

2. Flush to remove disinfecting solution:

This is a low velocity, low flow, flush through fire or flushing hydrants to remove the disinfecting solution from the new line. In new subdivisions, or in areas where there is an existing sanitary sewer, this discharge may be made into the sanitary sewer system. The Contractor is to provide sufficient hoses to connect from the hydrants to a manhole in a manner that provides a suitable air gap for backflow prevention. In projects where there are no sanitary sewers, the flushing of the disinfecting solution must not enter any streams or be discharged in a manner that causes any environmental damage. For site specific locations the Inspector may require the use of a neutralizing chemical and piping arrangement. (See drawing WAT-10, in Part II - "Standard Details" of these specifications). The expense of a neutralizing station is the responsibility of the Developer/Contractor. The Engineer shall indicate the need for a neutralizing station on the drawing.

3. Final Flush:

See Table 1, entitled "Flushing Schedule". The final flush is a medium velocity, medium flow flush to clear the line of any chlorine solution used in the tie-in and to provide for fresh water throughout the new lines.

TABLE 1

FLUSHING TABLE			
(Nominal) Main Size	Double Check Valve Single Gate Size (Note 1)	INITIAL FLUSH (Note 2)	FINAL FLUSH (Note 2)
		Min. Flow (gpm)	Max. Flow (gpm)
6"	4"	220	88
8"	4"	400	160
12"	6"	900	350
16"	6"	1500	624
20"	8"	2450	978
24"	12"	3525	1410
30"	Designed by Consultant	5505	2202
36"	Designed by Consultant	7935	3174

NOTE: 1) See description of "Preassembled Flushing Mechanism" Section II of the specifications, Detail WAT-6.

2) Approximation of flushing flows can be made by using either a pitot tube or a method of measuring the static discharge pressure from a hydrant used for discharge of the flushing water. See Section II of these specifications, WAT-9 "Discharge Table for Hydrants"..

3) On a case by case basis, dependent upon such variables as length of new waterline (<200'); space limitations; or other unforeseeable obstacles, the inspector may authorize the use of a smaller flushing device if the use of this device will provide for adequate flushing of the new waterline.

3.05 ABANDONMENT OF WATER SERVICE

Excavate at the main and expose the corporation stop. Turn off the corporation stop and disconnect the copper tubing from the corporation stop. Assist the Inspector in referencing the location of the corporation stop for County records. Remove the meter box, yoke and service line. The Inspector will turn in the meter to the County's Utilities Operations and Maintenance Section. When existing water services are to be abandoned as a part of a utility project, the Utility Contractor shall review the scope of the work with the Utilities Inspector and then proceed to abandon those services prior to any other work commencing.

3.06 ABANDONMENT OF WATER MAINS

Water mains and hydrant laterals to be abandoned shall be permanently disconnected from the remaining system. If the abandonment takes place at a tee, the tee shall be removed from the main and straight pipe installed. For other instances involving fittings, the proper fitting shall be installed to eliminate the previous connection.

All open ends on abandoned pipe to be permanently sealed by plugging with masonry and/or mortar or plug. All valve boxes, fire hydrants, flushing hydrants blow-offs or other appurtenances to be removed. Salvageable fire hydrants are to be returned to the County's Utilities Operations & Maintenance Section.

3.07 CLEAN-UP

Upon the completion of the installation of the water system and prior to the Owner's final acceptance, sediment and debris shall be removed from the system. The work area shall be restored to its original condition and pavement replaced to the satisfaction of VDOT and/or County.

End of Section

SECTION 6

SANITARY SEWER SYSTEM

I - GENERAL

1.01 RELATED DOCUMENTS

The general provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section. Work accomplished under this Section shall be in accordance with [County Standard Details](#).

1.02 DESCRIPTION OF WORK

- A. Contractor shall provide all labor, equipment, tools, services, and materials necessary for, or incidental to, the construction of sanitary sewers and appurtenances, in conformance with (but not limited to) the following:
 - 1. All trenching, excavation, backfilling as stated herein or shown on the drawings.
 - 2. Setting new pipe inverts, rim elevations of manholes, and other utility structures to the proper elevations as shown on the Plans.
 - 3. Testing all utility piping systems as applicable and stated herein.
 - 4. In general all proposed utility systems as covered in this Section will be installed in the confines of the site as noted on the Plans.
- B. Related Work Specified Elsewhere: Site clearing, trenching, backfilling, and compaction.

1.03 REQUIREMENTS OF REGULATORY AGENCIES

Construction as shown on the Plans or stated herein shall be performed in accordance with current and applicable requirements as established by the County of Chesterfield, the Virginia Department of Health, or any other agencies having jurisdiction. Where conflicts arise between the Contract Documents and previously mentioned requirements, the more restrictive shall apply. If such requirements shall require a change in the work as stated herein or shown on the drawings, the Contractor shall stop work and notify the owner for further direction.

II - PRODUCTS

2.01 APPROVED MATERIALS

All materials shall conform to the County of Chesterfield "Approved Materials and Manufacturers" list with latest revision date. Contractor shall follow guidelines as established in the General Conditions of this document under Other Plans and Working Drawings (Shop Drawings). All materials shall be virgin material.

2.02 PIPE BEDDING FOR GRAVITY SANITARY SEWERS

Bedding material to be crushed stone #57 gradation in accordance with VDOT Road and Bridge Specifications, latest edition.

III - EXECUTION

3.01 INSTALLATION OF NEW GRAVITY SANITARY SEWER AND FORCE MAIN SYSTEMS

A. Excavating and Backfilling:

1. Contractor shall do all excavating of any and all materials encountered in the course of excavating for all underground utility systems. After the pipe is in place, backfill with suitable material free from frozen earth, rocks, organic material, etc.
 - a. Provide all necessary shoring required for the protection of excavations, existing utilities and workmen and do all necessary pumping required to keep excavation and pipe free from water from any source at all times.
 - b. Provide sufficient barricades, etc., adjacent to excavations to safeguard against injury to workmen and the public. Provide and maintain sufficient warning lanterns at walks, roadways, and parking areas to provide safety at all times.
 - c. Where roots of live trees are encountered in excavations, they shall be carefully protected during construction.
 - d. Exercise special care in backfilling trenches to guard against disturbing the joints.
 - e. Remove and dispose of any material not used for backfill.

2. Removal of subsurface obstructions, which are uncovered during excavation for installation of the gravity sanitary sewer and force main systems shall be by the Contractor at his expense. This shall include removal of existing concrete or brick of existing building foundations, footings, abandoned utility piping, wires, structures, rock boulders, etc., which may not be visible from surface investigations before construction, but will interfere with new installations. If such obstructions are encountered, they shall be removed two feet from around the area of new work and the excavation backfilled with a suitable material as specified.

B. Pipe Handling:

1. Take all precautions to insure that pipe and related items are not damaged in unloading, handling and placing in trench. Examine each piece of material just prior to installation to determine that no damage has occurred. Remove any damaged material from the site and replace with undamaged material.
2. Keep pipe clean. Exercise care to keep foreign material and dirt from entering pipe during storage, handling and placing in trench. Flushing line may be necessary by the Contractor.
3. Survey Line and Grade for Gravity Sanitary Sewers:
 - a. Line and grade shall be maintained by the Contractor by use of a laser and Contractor shall adhere to the following criteria:
 - 1) Control point shall be set at a minimum of fifty foot (50') interval. Line and grade of the laser shall be checked at a maximum of one hundred foot (100') intervals.
 - 2) Standard cut sheet shall be provided to the County showing center line cut each twenty-five (25') where payment for installation is on a cut increment basis and hub cut at each fifty foot (50') station.
 - 3) The level vial on the grade instrument of the laser shall be checked at a minimum of each 30 minutes of use or more frequent if equipment is being used around the grade instrument that could cause the instrument to become unlevel.
 - 4) A blower shall be used when required to keep a uniform air temperature in the pipe to prevent any bending of the light beam.

- b. Contractor shall have level or transit in good working order on job set up at all times to periodically check line and grade of pipe.
4. Sewer Pipe Laying for Gravity Sanitary Sewers:
- a. Laying of sewer pipe shall be accomplished to line and grade in the trench only after it has been dewatered and the foundation and/or bedding has been prepared. Mud, silt, gravel, and other foreign material shall be kept out of the pipe and off the jointing surfaces.
 - b. All pipe laid shall be retained in position so as to maintain alignment and joint closure until sufficient backfill has been completed to adequately hold the pipe in place. All pipe shall be laid to conform to the prescribed line and grade shown on the drawings. After completion the pipe shall exhibit a full circle of light at one manhole when viewed from the next.
 - c. The sewer pipe, unless otherwise approved by the Owner, shall be laid up to grade from point of connection of the existing sewer or from a designated starting point. If the starting point is an existing stub, it shall be removed and a full length of pipe installed. The sewer pipe shall be installed with the bell end forward or upgrade. When pipe laying is not in progress the forward end of the pipe shall be kept tightly closed with a water tight plug or cap.
 - d. The pipe shall be fitted and matched so that when installed it will form a smooth, uniform invert. Lined or radius concrete pipe shall be placed as indicated by the marking on the pipe.
 - e. Prior to joining the pipe, all surfaces of the pipe to be joined and the surfaces of factory made jointing materials shall be clean and dry. Lubricants, primers, adhesives, etc., shall be applied and the pipes joined as recommended by the manufacturer's specifications. Sufficient pressure shall be applied in making the joint to assure that the pipe is "home". The interior of the pipe shall be cleaned of all foreign material as the work progresses. At the end of the work day, the last pipe laid shall be blocked to prevent creep, and closed with a water tight plug or cap.

f. Joining Pipe for Gravity Sanitary Sewers:

- 1) Ductile iron pipe to be joined in accordance with the requirements of the AWWA Standard C600 and the manufacturer's recommendations.
 - 2) Reinforced concrete pipe shall be jointed in accordance with manufacturer's recommendations.
 - 3) Polyvinyl chloride (PVC) pipe shall be joined in accordance with ASTM Standard D-2321.
- g. Pipe laying and joining for force mains shall be the same as the requirements for water lines.
- h. All visible leaks shall be corrected before testing.
- i. PVC pipe shall be provided with anti-flotation ballast where cover is less than 3'.

C. Manhole Installation:

1. Manholes shall be constructed to the elevations indicated in accordance with the Standard Details.
 - a. Set manhole base section on bed of #57 stone to a minimum depth of 8 in. Stone shall be thoroughly compacted and carefully leveled to the excavated wall.
 - b. Join all manhole risers, cone top sections, and any other sections by the use of rubber gaskets.
 - c. Install pipe stubs in manholes where called for on the Plans. All stubs shall extend beyond the manhole as reflected on the plans and shall be sealed with a watertight plug or cap.
 - d. Install flexible manhole connections for all pipes sizes 6 in. to 21 in., inclusive and apply sealant to completely fill joint between manhole barrel and flexible connection for the full thickness of the manhole barrel.
 - e. Plug lift holes from the outside with nonshrink grout and repair any defects in manhole.
 - f.. Set adjusting rings in portland cement mortar bed (minimum of 1/4" thickness and parge 1/8" to 1/4" thickness on inside and outside of manhole).

- g. Rings will not be required outside of paved roadways or walkways unless called for on the Plans.
- h. Rings in paved roadways or walkways shall permit upward or downward adjustment of manhole frame. Maximum height of rings shall not exceed 12, otherwise, the cone section will require removal and an additional manhole riser installed to allow for the upward and downward adjustment as stated above.
- i. Construct bench of concrete or brick and mortar only.
 - 1) Elevation of bench at the channel shall be at the spring line of the incoming and outgoing pipe.
 - 2) Bench shall be three inches lower at channel than at manhole wall.
 - 3) Where B.U.O. or stubs are provided for future pipe connections, bench and invert shall be so formed.
 - 4) Use sulfate resistant cement for concrete or mortar on all acid-resistant manholes.
 - 5) Where sealant is used, bench shall not be in contact with pipe or flexible pipe connection.
 - 6) All inverts to be smooth.
- j. All visible leaks shall be corrected before testing.

D. Service Connections: Place a tee fitting with 6-inch outlet in the sewer where service connection is to be constructed. Lay 6 inch PVC or ductile iron pipe from the tee to the property line or easement limits on a grade of not less than 1/4 in. per foot unless otherwise shown on Plans. Where connections are laid out of manholes, Contractor shall use a laser beam. Close service connection at the property line with an approved watertight plug, and mark the end with a 2" x 4" board installed plumb from bottom of 6" plug to 2' above ground. Service connection shall be of same type of pipe as sewer unless otherwise approved by Owner. When making a service connection to an existing sewer, the Contractor shall use a mechanical hole cutter and approved saddle.

E. Existing Manhole Tie-In: Core drilling and a flexible pipe-to-manhole connector shall be used in the connection of the sewer pipe to precast manholes, where stubs or bricked up openings (B.U.O.) do not exist.

The connector shall be Kor-N-Seal assembly or approved equal.

The connector shall be installed in the manhole wall by activating the expanding mechanism in strict accordance with the recommendation of the connector manufacturer.

The connector shall be of a size specifically designed for the pipe material and size being utilized on the project. All materials must conform to the approved products reflected in Part V of this document.

Where bricked up openings (B.U.O.) exist, a PVC manhole adaptor shall be used in the connection of the sewer pipe to precast manholes and installed using the proper conventional methods such as the process established for the "GPK PVC Manhole Adaptors" or equal.

- F. A tracing wire of 14 gauge copper shall be installed and taped directly on top of the pipe in a manner that a continuous trace results.
- G. Place underground warning tape directly above all sewer force mains, 18" below finished grade. Tape shall be polyethylene tape with a metallic core, 2 inches in width, with the continuous printed message "Caution Sewer Force Main Buried Below." Tape shall be as manufactured by the Seton Name Plate Corp. or approved equal.
- H. Installation of Sewer Lines and Laterals as it relates to Sidewalks:
 - 1. Sidewalks must be constructed to accommodate at least a 10 foot horizontal separation between the County's public sewer mains.
 - 2. If sidewalks are constructed within the public road right-of-way, the end of the sewer lateral must be installed 3 feet behind the house side of the sidewalk or to the right-of-way line, whichever is greater.
 - 3. If sidewalks are constructed outside of the public right-of-way and are less than 5 feet from the right-of-way line, the end of the sewer lateral must be installed 3 feet behind the house side of the sidewalk.
 - 4. If the sidewalks are constructed outside of the public right-of-way and are more than 5 feet from the right-of-way line, the sewer services must be installed within 1 foot outside of the right-of-way line.

3.02 TESTING OF NEW GRAVITY SANITARY SEWER AND FORCE MAIN SYSTEMS

- A. Testing Technique for Gravity Sanitary Sewer System:
 - 1. Sanitary sewer lines 42 inches in diameter and smaller shall be tested after backfill using a low-pressure air test in accordance with ASTM C828-90 or latest edition. Sewer lines larger than 42 inches in diameter

shall be tested by infiltration/exfiltration test. All manholes shall be vacuum tested. All testing shall be conducted in the presence of the Owner or Owner's representative. All labor, materials, tools, and equipment necessary to make the tests shall be provided by the Contractor. All equipment and methods used shall be acceptable to the Owner. All monitoring gauges shall be subject to calibration, if deemed necessary.

2. Low Pressure Air Test:

- a. Summary of Method: Plug the section of the sewer line to be tested. Introduce low-pressure air into the plugged line. Use the quantity and rate of air loss to determine the acceptability of the section being tested.
- b. Preparation of the Sewer Line: If required by Owner, flush and clean the sewer line prior to testing and cleaning out any debris. Plug all pipe outlets using approved pneumatic plugs with a sealing length equal to or greater than the diameter of the line being tested. Give special attention to laterals.
- c. Ground Water Determination: Install a ½ inch capped galvanized pipe nipple, approximately 12 inches long, through the manhole on top of the lowest sewer line in the manhole. Immediately prior to the line acceptance test, the ground water elevation shall be determined by removing the pipe cap and blowing air through the pipe nipple into the ground so as to clear it, and then connecting a clear plastic hose to the pipe nipple. The hose shall be held vertically and a measurement of the height in feet of water over the invert of the pipe shall be taken after the water has stopped rising in the plastic hose.
- d. Procedures: Determine the test duration for the section under test by computation from the applicable formulas shown in ASTM C828-90 or latest edition. The pressure-holding time is based on an average holding pressure of 3 psi gage or a drop from 3.5 psi to 2.5 psi gage.

Add air until the internal air pressure of the sewer line is raised to approximately 4.0 psi gage. After an internal pressure of approximately 4.0 psig is obtained, allow time for the air pressure to stabilize. The pressure will normally show some drop until the temperature of the air in the test section stabilizes.

When the pressure has stabilized and is at or above the starting test pressure of 3.5 psi gage, commence the test. Before starting the test, the pressure may be allowed to drop to 3.5 psi gage. Record the drop in pressure for the test period. If the pressure has dropped more than 1.0 psi gage during the test period, the line shall be presumed to have failed. The test may be discontinued when the prescribed test time has been completed even though the 1.0 psi gage drop has not occurred.

The test procedure may be used as a presumptive test which enables the installer to determine the acceptability of the line prior to backfill and subsequent construction activities.

If the pipe to be tested is submerged in ground water, the test pressure shall be increased by 1.0 psi for every 2.31 feet the ground water level is above the invert of the sewer.

- e. Safety: The air test may be dangerous if, because of lack of understanding or carelessness, a line is improperly prepared.

It is extremely important that the various plugs be installed and braced in such a way as to prevent blowouts. Inasmuch as a force of 250 lb. is exerted on an 8 inch plug by an internal pipe pressure of 5 psi, it should be realized that sudden expulsion of a poorly installed plug or of a plug that is partially deflated before the pipe pressure is released can be dangerous.

As a safety precaution, pressurized equipment shall include a regulator or relief valve set at no more than 10 psi to avoid over-pressurizing and damaging an otherwise acceptable line. No one shall be allowed in the manholes during testing.

- 3. All manholes will be tested using the negative air pressure test (vacuum) in accordance with ASTM C 1244-93 or latest edition, for watertightness, and manhole will be visually inspected after backfilling. Contractor may backfill before testing with the understanding that any repairs will be made from the exterior of the manhole.

Manholes shall be vacuum tested and shall have 10-inches of mercury applied to the manhole and the time measured for the vacuum to drop from 10-inches to 9-inches of mercury. Vacuum equipment shall be approved by the County and/or Engineer prior to its use. See detail # SEW-10 for minimum allowable test times for manhole acceptance at the specified vacuum drop.

Test times for structures other than manholes will be based on the times for manholes of the nearest equivalent volume or as directed by the Engineer.

Written verification must be furnished that the following steps are followed:

- a. The test method is only to be applied to precast concrete manholes.
 - b. Stubouts, manhole boots and pipe plugs shall be secured to prevent movement while the vacuum is drawn.
 - c. If a manhole fails the test, necessary repairs shall be made and the vacuum test and repairs shall be repeated until the manhole passes the test.
4. Test for leakage of gravity sewers using either the infiltration or exfiltration test:
- a. Allowable leakage shall be 50 gallons per inch of pipe diameter per mile per 24 hours up to a maximum of 2,400 gallons per mile per 24 hours for gravity sewers greater than 42" in diameter.
 - b. Use infiltration test when ground water is at least 4 feet above pipe crown along entire length of line to be tested. Plug the pipe at the upper manhole. Install suitable measuring device at the next lowest manhole. Measure the amount of water flowing through the outlet after flow has been stabilized.
 - c. Ground Water Determination: Use same procedure as "low pressure air test" above.

B. Testing Requirements for Sewer Force Mains:

1. All pressure testing shall conform to the requirements as established for Water Distribution Systems as outlined in Part III Section 3 of this document.

3.03 MARKERS

In easements and in undeveloped wooded areas, plastic markers shall be installed every 200 feet, and at all manholes, valves, and fittings. Markers shall be as manufactured by Carsonite, Greenline, or approved equal. Exceptions are where sanitary gravity and force main lines are installed in "kept" yards where the property owners may object to the placement of these markers. Contractors will be required to properly install the markers per manufacturer's recommendations, parallel to the sewer line facing roadway, or as additionally directed by the County.

3.04 CLEAN-UP

Upon the completion of the installation of the sanitary sewer system and prior to the Owner's final acceptance, sediment and debris shall be removed from the system. The work area shall be restored to its original condition and pavement replaced to the satisfaction of VDOT and/or County.

End of Section

SECTION 7

ESTABLISHING VEGETATION

I - GENERAL

1.01 RELATED DOCUMENTS

The Plans and general provisions of the Contract, including General and Supplementary Conditions and Specification sections, apply to work specified in this Section.

1.02 DESCRIPTION OF WORK

The Contractor shall furnish all labor, materials, equipment and services necessary for and reasonably incidental to, seedbed preparation, liming, fertilizing, seeding and mulching of all residential areas. In wooded areas, the requirements of Section 3 shall apply.

1.03 SUBMITTALS

- A. Seed: Furnish duplicate signed copies of a statement from the vendor, certifying that each container is fully labeled in accordance with the Seed Improvement Association requirements for certification. This certification shall appear on, or with, all copies of invoices for the seed. Each lot of seed will be subject to sampling and testing at the discretion of the Owner. Sampling and testing will be in accordance with the latest regulation under the Federal Seed Act. Samples shall be submitted at least 40 days in advance of the planned planting date.
- B. Fertilizer and Lime: Furnish duplicate copies of invoices for all fertilizer and lime used on the project. Invoices for fertilizer shall show the analysis and the quantity furnished. Invoices for lime shall show the percentage of magnesium oxide and quantity furnished. Upon completion of the project, a final check of the total quantities of fertilizer and lime used will be made against the total area seeded and if the rates of application have not been met, additional quantities of these materials shall be applied to make up the application specified.
- C. Mulch: At least 5 working days prior to the initiation of the seeding work, the Contractor shall furnish for approval representative samples of the materials proposed to be used.
- D. Liquid Mulch Binding: Shall be in accordance with the Virginia Erosion Control Handbook, latest edition. Asphaltic binders will not be allowed.

II - PRODUCTS

2.01 LIMESTONE

Lime shall be dolomitic agricultural-ground limestone containing not less than 10% magnesium oxide.

2.02 COMMERCIAL FERTILIZER

Fertilizer shall be the standard commercial product of 10-10-10 analysis. All fertilizer shall be delivered in bags bearing the manufacturer's name, the chemical analysis of the product, and its weight. If not used immediately after delivery, fertilizer shall be stored in a manner that will not allow it to harden or destroy its effectiveness.

2.03 SEED

Seed shall be new crop seed labeled in accordance with the U.S. Department of Agriculture, "Rules and Regulations under the Federal Seed Act." All seed shall be furnished in sealed standard containers. Seed which has become wet, moldy, or otherwise damaged prior to seeding, will not be acceptable.

2.04 MULCH

Mulch shall be any of the materials noted below:

- A. Grain Straw: Mulch material which contains an excessive quantity of matured seed of noxious weed or other species which would hinder the establishment of desirable vegetation will not be accepted. Any mulch material which is fresh or excessively brittle or which is in such an advanced stage of decomposition as to smother or retard growth of grass will not be accepted.
- B. Wood Cellulose Fiber Mulch: Wood cellulose fiber mulch for use with the hydraulic application of grass seed and fertilizer shall consist of specially prepared wood cellulose fiber. It shall be processed in such a manner that it will contain no growth or germination inhibiting factors and shall be dyed an appropriate color to facilitate metering of materials. It shall be manufactured in such a manner that after addition and agitation in slurry tanks with fertilizers, grass seeds, water, and any other approved additives, the fibers in the material will become uniformly suspended to form a homogeneous slurry; that when hydraulically sprayed on the ground, the material will form a blotter like ground cover impregnated uniformly with grass seed; which after application, will allow the absorption of moisture and allow rainfall or mechanical watering to percolate to the underlying soil. Suppliers shall be prepared to certify that laboratory and field testing of their product has been accomplished, and that it meets all of the foregoing requirements based upon such testing. Weight specifications of this material from suppliers, and for all applications, shall refer only to air dry weight of the fiber material. Absolute air dry weight is based on the normal weight standard of the Technical Association of the Pulp and Paper Industry for wood cellulose and is considered equivalent to 10% moisture. Each package of the cellulose fiber shall be marked by the manufacturer to show the air dry weight content.

2.05 WATER

Water shall be clean, potable water.

2.06 TOPSOIL

Topsoil required in excess of that available from stripping topsoil from the site shall be provided by the Contractor from sources offsite. The topsoil shall be natural, friable, sandy loam or fine sandy loam, possessing the characteristics of producing heavy growths of agricultural crops and shall be obtained from naturally well-drained areas. The topsoil shall be reasonably free from subsoil, clay lumps, brush, stumps, objectionable weeds, other litter, and any other material or substance which might be harmful to plant growth or a hindrance to grading, planting or maintenance operations. The topsoil proposed for use shall be inspected and approved at its natural location prior to its being moved to the construction site. At the time of inspection, the Owner may require representative soil samples to be taken from several locations of the areas under consideration and tested for physical properties, pH, available phosphate and potash and organic matter. If such tests are required, they shall be at the Contractor's expense.

2.07 SPECIAL SEEDING AND MULCHING EQUIPMENT

- A. Seeder: Equipment to be used for applying a seed-fertilizer mix over prepared slopes shall be a hydraulic seeder designed to pump a water-seed-fertilizer mixture over areas to be seeded at the specified rates. A power-driven agitator keeps the mixture uniform during the seeding cycle.
- B. Mulch Spreader: Equipment to be used for spreading mulch shall be equipment designed to apply a liquid binder to the straw mulch material at the end of a movable broom, then with a high velocity air stream, blow the straw over the graded areas to form a uniform, porous, stable blanket, tied in place by the liquid binder.
- C. Wood Cellulose Fiber Mulch Spreader: Hydraulic equipment used for the application of fertilizer, seed, and slurry or prepared wood pulp shall have a built-in agitation system with an operating capacity sufficient to agitate, suspend, and homogeneously mix a slurry containing up to 40 pounds of fiber plus a combined total of 70 pounds of fertilizer solids for each 100 gallons of water. The slurry distribution lines shall be large enough to prevent stoppage. The discharge line shall be equipped with a set of hydraulic spray nozzles which will provide even distribution of the slurry on the various slopes to be seeded. The slurry tank shall have a minimum capacity of 1,000 gallons and shall be mounted on a traveling unit which may be either self-propelled or drawn with a separate unit which will place the slurry tank and spray nozzles within sufficient proximity to the areas to be seeded so as to provide uniform distribution without waste. Equipment with smaller tank capacity may be used provided that the equipment has the necessary agitation system and sufficient pump capacity to spray the slurry in a uniform coat.

III - EXECUTION

3.01 SEEDBED PREPARATION

- A. General: Equipment necessary for the proper preparation of the seedbed and for handling and placing of all required materials shall be on hand, in good condition and shall be approved before the work is started.
- B. Clearing: Prior to or during grading and tillage operations, the ground surface shall be cleared of stumps, stones, roots, cable, wire, grade stakes, and other materials that might hinder proper grading, tillage, seeding, or subsequent maintenance operations.
- C. Grading: Grades on the area to be treated shall be maintained in a true and even condition. Maintenance shall include any necessary repairs to previously graded areas.
- D. Tillage: All graded areas shall be thoroughly tilled to a depth of at least 4 inches by plowing, disking, harrowing, or other approved methods until the condition of the soil is acceptable. On sites where soil conditions are such that high clay content and excessive compaction cause difficulty in getting clods and lumps effectively pulverized, the Contractor shall use the rotary tillage machinery, until the mixing of the soil is acceptable and no clods or clumps larger than 1-1/2 inches in diameter remain. A firm and compact seedbed is required, and after being graded, the seedbed shall be lightly compacted with a land roller, such as a cultipacker, before and after seeding. All tillage operations shall be as near on the contour as is practical but in no instance up and down the slope.
- E. Topsoiling: The topsoil shall be uniformly distributed on the designated areas and evenly spread to an average thickness of 4 inches, with a minimum thickness of 3 inches. Prior to placing the topsoil, the subgrade, wherever excessively compacted by traffic or other causes, shall be loosened by disking or by scarifying to a depth of at least 2 inches, to permit bonding to the subgrade. The spreading shall be performed in such a manner that planting can proceed with little additional soil preparation or tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions where water will stand. Topsoil shall not be placed when the subgrade is frozen, excessively wet, extremely dry, or in a condition otherwise detrimental to the planting or to proper grading.

3.02 LIMING

Limestone shall be uniformly applied at a rate of 3,000 pounds per acre (70 pounds per 1,000 square feet) to all areas to be vegetated. Limestone may be applied to the area prior to the preparation of the seedbed, but in all cases, it shall be applied before seeding and thoroughly incorporated into the entire depth of the prepared seedbed. The incorporation of the lime may form a part of the tillage operation specified above.

3.03 FERTILIZING

The fertilizer shall be uniformly applied at the rate of 1,000 pounds per acre (23 pounds per 1,000 square feet) to all areas to be vegetated. The fertilizer shall be incorporated into the upper three or four inches of prepared seedbed. This can be done just prior to the last tillage operation or just prior to seeding, but in no case, will it be applied more than 3 days before seeding or before the lime is applied. Distribution by means of an approved seed drill equipped to sow seed and distribute fertilizer at the same time will be acceptable. When hydroseeding equipment is used for planting operation, fertilizer shall be applied simultaneously with seed using the above rate of application.

3.04 SEEDING

- A. General: The Contractor shall make use of special hydroseeding equipment or approved mechanical power-drawn seeders. When conditions are such, by reason of drought, high winds, excessive moisture, or other factors that satisfactory results are not likely to be obtained, the work shall be stopped, and resumed only when conditions are favorable. If inspection during seeding operation, or after there is a show of green, indicates that strips wider than spaces between the rows planted have been left, or other areas skipped, additional seed shall be sown on these areas. Seed shall be sown as specified in the following table:

SITE SPECIFIC SEEDING MIXTURES

	<u>Total Lbs.</u> <u>Per Acre</u>
<u>Minimum Care Lawn</u>	
- Commercial or Residential	175-200 lbs.
- Kentucky 31 or Turf-Type Tall Fescue	95-100%
- Improved Perennial Ryegrass	0-5%
- Kentucky Bluegrass	0-5%
<u>High-Maintenance Lawn</u>	200-250 lbs.
- Kentucky 31 or Turf-Type Tall Fescue	100%
- or dwarf type or as noted on plans and/or job specifications	
<u>General Slope (3:1 or less)</u>	
- Kentucky 31 Fescue	128 lbs.
- Red Top Grass	2 lbs.
- Seasonal Nurse Crop*	20 lbs.
	150 lbs.
<u>Low-Maintenance Slope (Steeper than 3:1)</u>	
- Kentucky 31 Fescue	108 lbs.
- Red Top Grass	2 lbs.
- Seasonal Nurse Crop*	20 lbs.
- Crown vetch**	20 lbs.
	150 lbs.

* Use seasonal nurse crop in accordance with seeding dates as stated below:

February 16th through April Annual Rye
 May 1st through August 15th Foxtail Millet
 August 16th through October Annual Rye
 November through February 15th Winter Rye

** Substitute Sericea lespedeza for Crown vetch east of Farmville, VA (May through September use hulled Sericea, all other periods, use unhulled Sericea). If Flatpea is used in lieu of Crown vetch, increase rate to 30 lbs./acre. All legume seed must be properly inoculated. Weeping Lovegrass may be added to any slop or low maintenance mix during warmer seeding periods; add 10-20 lbs./acre in mixes.

- B. Broadcast Seeding: In areas too confined for the operation of machinery, hand-operated equipment, such as the "Cyclone" seeder, shall be employed. The seed shall be uniformly distributed over the designated areas. Half the seed shall be sown with the sower moving in one direction, and the remainder shall be sown with the sower moving at right angles to the first sowing. In confined areas, the seed shall be covered, but no deeper than 1/4 inch, by means of rakes or other approved hand tools. Broadcast seeding shall not be done during windy weather.
- C. Slurry Seeding: Seed shall be sown with an approved hydroseeded in combination with fertilizer, or in combination with wood cellulose fiber mulch and fertilizer. Seed shall be uniformly distributed over the areas to be seeded.
- D. Mechanical Power-Driven Seeder: Seeding shall be accomplished with a combination grass planter and land packer or pulverizer, the seed shall be planted no deeper than 1/4 inch. The seeding operation should be as near on the contour as is practical, but never up and down the slope. After seeding, the seeded areas shall be compacted with a land roller, such as a cultipacker. It will be permissible to sow the seed and cultipack the soil all in one operation if the proper equipment is used.

3.05 MULCHING

- A. General: The surface of all seeded areas shall be protected by the application of any of the before-mentioned mulch material unless otherwise specified.
- B. Straw shall be applied evenly over the seeded area in such a manner that thickness of the mulch is approximately uniform throughout the treated area and sunlight is not completely excluded from penetration to the ground surface. The straw mulch shall be applied at the rate of one and one-half tons per acre.

- C. Wood Cellulose Fiber Mulch: The application of the wood cellulose fiber mulch shall be with the hydroseeder and shall be accomplished immediately after completion of the final tillage operation. The wood cellulose fiber mulch shall be applied at the rate of 1,000 pounds per acre in combination with water, fertilizer and seed and shall be sprayed over the soil in a uniform coat.
- D. Anchoring Mulch: Straw shall be anchored in place by use of a cut-away rolling flat disk packer or by uniformly spraying the straw with the liquid binder at the application rate recommended by the manufacturer.

3.06 PROTECTION

The area shall be protected against foot and vehicular traffic by erecting adequate barricades immediately after seeding is completed, and by placing warning signs of an approved type.

3.07 ESTABLISHMENT

The Contractor shall be responsible for the proper care of the seeded area during the period when the vegetation is being established or until a good stand of grass has been obtained. In the event of an erosive rain before an adequate stand of vegetation is established, damaged areas shall be repaired, limed, fertilized, seeded, and mulched wholly at the Contractor's expense.

End of Section

SECTION 8

CONTRACTOR ENVIRONMENTAL ACTIVITIES

I - GENERAL

1.01 INTRODUCTION

- A. The following information is supplied to contractors who perform work on projects for the Chesterfield County Utilities Department. The information presented herein has been developed to comply with the Chesterfield County Environmental Management System (EMS). The intent of this information is to make contractors aware of the EMS and to ensure that they conform to the applicable EMS procedures and instructions.

Contractors shall submit a completed Contractor Environmental Checklist (see Appendix C). The Contractor shall prepare a Contractor Environmental Activity Statement (see Appendix D) and submit it to the Utilities Department. The Statement will be reviewed by the Environmental Management Office before a purchase order is issued.

- B. Conformance with the Environmental Policy and all requirements noted in this document is expected of all Contractors, subcontractors, and their employees. Failure to follow these requirements will be grounds for termination of the contract.
- C. Contractors shall be responsible for compliance with relevant environmental legislation and regulations and for ensuring the compliance of subcontractors.
- D. A copy of the County Environmental Policy (see Appendix E) is attached to this section.

1.02 ENVIRONMENTAL MANAGEMENT BASICS

- A. Contractors shall not transport hazardous chemicals on-site without having the associated Material Safety Data Sheets (MSDS) for each substance to be used. These materials include, but are not limited to; sealers, adhesives, paints, coatings, fuels, oils, acids, and caustics.
- B. Contractors shall provide adequate control of fugitive dust emissions during all operations and activities.
- C. Contractors shall not discharge anything to drains and/or sewers without the prior approval of the Utilities Department.

- D. Contractors shall provide adequate spill/release prevention for all bulk materials.
- E. Contractors shall immediately notify the Utilities Department of any spills, releases, or other environmental incidents. Contractors shall subsequently submit a completed Environmental Tracking of Spills and Releases form (see Appendix F) to the Utilities Department.
- F. Contractors shall properly label, store, and dispose of all waste materials.
- G. Contractors shall be sensitive to the effects of noise, odor, light, and traffic movement on the local community and implement appropriate remedial actions as required.
- H. The requirements of the Contractor Environmental Activity Statement (see Appendix D) are described in a subsequent section of this document.

1.03 WASTE DISPOSAL

- A. All waste disposal (construction debris, scrap metal, non-hazardous waste, municipal solid waste, etc.) shall be the Contractor's responsibility, unless otherwise noted.
- B. The Contractor shall inform the Utilities Department of all generated hazardous waste streams before a waste is generated and collected on-site. The Contractor shall provide the Utilities Department with manifests for all hazardous wastes.
- C. The Contractor shall inform the Utilities Department of the location of all generated hazardous waste storage areas, maximum quantities, and the container type.
- D. The Contractor shall label all containers with their contents and the responsible Contractor's name and contact information. NO UNLABELED CONTAINERS SHALL BE PERMITTED ON-SITE.
- E. The Contractor shall provide all shipping information and relevant documentation (MSDS, Waste Profiles, Bills of Lading, and inventory) to the Utilities Department upon request.

1.04 EQUIPMENT DECOMMISSIONING

- A. All equipment shall be thoroughly inspected by the Contractor for fluids and other hazardous materials prior to removal.

- B. All fluids and other hazardous materials shall be removed by the Contractor prior to decommissioning of equipment.
- C. The Contractor shall dispose of any waste generated in accordance with the above instructions.

1.05 WATER DISCHARGES

- A. Discharge of materials to ANY sewer system, other than approved sanitary sewage discharges to the sanitary sewer system is prohibited.
- B. Discharges of ANY material to outside clean drains other than storm water are prohibited.

1.06 MATERIAL STORAGE/SPILLS

- A. Plans for outside storage of potentially environmentally damaging materials shall be approved by the Utilities Department prior to the commencement of the work. Considerations such as shelter from the elements and containment size shall be addressed.
- B. The Contractor shall provide adequate outside storage areas for chemical materials that are equipped with non-earthed secondary containment in accordance with applicable regulations.
- C. The Contractor shall ensure that all material containers owned or managed by the Contractor are properly labeled in accordance with the OSHA HAZARD COMMUNICATION STANDARD (i.e., contents, primary hazard).
- D. The Contractor shall have MSDS available for all chemical products in use at all times that their employees are working on-site. MSDS will be made available to Utilities personnel, medical personnel, environmental personnel, or other representatives upon request.
- E. The Contractor shall ensure that chemical containers are closed except when in use.
- F. Contractors shall maintain spill kits to contain and clean up small spills generated by their employees or from their materials. Spill kits shall be kept on-site and made easily accessible during an emergency. Disposal of all spill residues shall be in compliance with appropriate environmental regulations.

- G. The Contractor shall immediately report all spills or releases to the Utilities Department. Contractors shall subsequently submit a completed Environmental Tracking of Spills and Releases form (see Appendix F) to the Utilities Department.

1.07 STORM WATER MANAGEMENT

- A. No process materials or any other sources of water pollution shall be commingled with storm water.
- B. Solids shall be prevented from entering sewer drains. Roadways and outside areas shall be kept clean at all times.
- C. It is the Contractor's responsibility to install storm water control measures such as silt fences, straw bales, etc. to control the solids entering storm drains from erosion or other processes as necessary.
- D. Vehicle maintenance shall not be performed near storm drains.

1.08 PCB'S

- A. The Contractor shall notify the Utilities Department if a material is suspected to have PCB contamination.
- B. All PCB removals shall be coordinated by the Environmental Management Office.
- C. Any lighting ballast that does not state that it is a non-PCB containing ballast shall be disposed of as PCB containing.

1.09 ASBESTOS

- A. The Contractor shall stop work and notify the Utilities Department immediately if he encounters previously unidentified asbestos materials.
- B. All asbestos removal and disposal activities shall be conducted in accordance with procedures approved by the Chesterfield County's Environmental Program Manager.

1.10 LEAD

- A. The Contractor shall stop work and notify the Utilities Department immediately if he encounters previously unidentified lead materials.

- B. All lead removal and disposal activities shall be conducted in accordance with procedures approved by the Environmental Program Manager.

1.11 CFC'S

- A. The Contractor shall provide copies of employee training certificates to the Utilities Department upon request.
- B. Intentional venting of CFC's to the atmosphere is prohibited.

1.12 SITE CONDITIONS

- A. The Contractor shall keep the site clean and orderly. Cleanup of trash, etc. generated by the Contractor's activities or the activities of employees shall be the Contractor's responsibility.

APPENDIX A

PRE-CONSTRUCTION MEETING CHECKLIST

Project Name: _____

Project Number: Sewer - _____

Water - _____

Date: _____

Engineer: _____

Contractor:

Attending:

Name

Company

Phone

[illegible]

Subjects to be discussed:

- _____ 1. **Easements** - Have all the easements been signed by the property owners? Restoration forms need to be given to Inspector. All special work, as agreed upon through the easement acquisitions, need to be brought up at this time.
- _____ 2. **Plan Revisions** - Discuss any changes that may have arisen since the bids were received. Revisions may constitute Engineer to send out revised plans to Contractor and Inspector, and County's Design Section prior to the start of work where the revision is being made.
- _____ 3. **Erosion Control** - Are there any perceivable problems with erosion and/or sediment control measures? The contractor and Inspector shall schedule and attend a meeting with a representative of Environmental Engineering to discuss erosion and sediment control measures to be employed on this project.
- _____ 4. **Tax Exemption** - Has the Engineer made application to the State Water Control Board for tax exemption on the sewer project? The contractor is to obtain the necessary tax exempt documents from the Department of Taxation.
- _____ 5. **Location of New Water and Sewer Services** - The County Inspector and Contractor will notify all property owners to coordinate the location of their sewer and/or water service connections.
- _____ 6. **Highway Permits** - The contractor shall obtain the required Highway Permits prior to working within the Virginia Department of Highways and Transportation's Right of Way.
- _____ 7. **Construction Signs** - Is the contractor aware of what construction signs are necessary and proper? The Contractor shall submit to Virginia Department of Highways and Transportation the required information regarding signing and traffic detouring for their review and approval.
- _____ 8. **Street Closings** - The contractor is to coordinate all street closings, etc. required during construction with the Virginia Department of Highways and Transportation. These closings, etc. will be in accordance with the Highway Permits for this project. In addition, the contractor shall notify the Chesterfield County Police and Fire Department, and the local Rescue Squads of all street closings, detours, etc.

- _____ 9. **Compaction** - The County reminds the contractor to compact thoroughly as prescribed by Virginia Department of Highways and Transportation in State R/W's and in easements as prescribed by County requirements.
- _____ 10. **Safety** - All necessary safety precautions will be addressed. Inspectors will advise the work foreman at the project site if, in his opinion, any unsafe practices are being employed during construction. If not corrected or questions arise about what is considered safe or unsafe, the County inspector would then notify OSHA and request that an OSHA Inspector visit the site to observe the conditions and specify the corrective measures needed.
- _____ 11. **Dust Control** - The contractor will control dust at all times.
- _____ 12. **Miss Utility** - The contractor shall notify "Miss Utility" 48 hours prior to start of work locate the existing utilities within the project area. Any possible conflicts will be brought to the attention of the project Inspector and Engineer.
- _____ 13. **Road Repairs** - The contractor needs to furnish to the County his schedule for pavement replacements. The method of replacement is to be in strict accordance with the Highway Permits, however, if base material is not present, Inspector and Contractor shall arrange a meeting with Virginia Department of Highways and Transportation to discuss other possible methods of pavement restoration. Pavement replacement must be performed, where possible, prior to the winter months (November 15 - April 1).
- _____ 14. **Periodic Estimates** - The County Inspector and contractor will jointly prepare monthly estimates. The time of the month when they will be prepared will be determined by the contractor and inspector. Separate estimates will be prepared for water and sewer installations. Seven (7) copies are to go to the Engineer for review and approval.
- _____ 15. **Subcontractors** - Will there be subcontractors, and if so, have they been approved by the Engineer?
- _____ 16. **Suppliers** - Who will be the suppliers, and have they been approved by the Engineer?
- _____ 17. **Progress Meetings** - Progress meetings are to be held through out the project. The frequency of these meetings will be determined at the pre-construction meeting.

- ____ 18. **Schedule for Construction** - The contractor is to furnish to the County and Engineer a detailed construction schedule at the pre-construction meeting, if possible, but at least five (5) working days prior to the start of work.
- ____ 19. **Notice to Proceed** - The contractor must start construction within ten (10) days of his notification to proceed.
- ____ 20. **Plans** - A sufficient number construction plans will be issued by the Engineer to the contractor and inspection.
- ____ 21. **Information** - The County needs the contractor's phone number and address in case of emergency, weekend and/or Holiday problems.
- ____ 22. **Staking of Lines** - Who will do the staking of lines and etc.? Are they certified?
- ____ 23. **Shop Drawings** - The contractor must submit all shop drawings to the Engineer and then to the County for approval.
- ____ 24. **Restoration** - To be performed in easements in strict accordance with the specifications unless specifically agreed by Inspector and Engineer as to another specified time for performing said work.
- ____ 25. **Personnel** -
- a. Contractors owner and his foreman or superintendent must attend the pre-construction meeting. All sub-contractors performing work on the project i.e., boring contractor, pipe installation contractor, etc. It is not necessary for paving contractor to attend, however, depending on the difficulty or complexity of the job, representatives from both Virginia Department of Highways and Transportation and the paving contractor must attend the meeting.
 - b. County's R/W Section, Water and/or Sewer Design Section, Water and Sewer Construction/ Inspection Section, and Water Maintenance Section (where appropriate) must have a representative attend each pre-construction meeting.
 - c. Design Engineer must attend meeting and be responsible for preparing detailed minutes of the pre-construction meeting and sending to all parties, a written letter outlining all items discussed.

26. **Change Orders** - All change orders must be made promptly by the Contractor prior to performing the work. All change orders must be approved by the Engineer and the County.
27. **Railroad Permits** -
- a. Contractor is responsible for obtaining Railroad Insurance.
 - b. The Contractor is to notify the Railroad Company and the County prior to construction.
 - c. The Contractor will be responsible for all expense associated with flagging, inspection, etc. by Railroad employees.
28. **Land Disturbance Permit** - Contractor has obtained his permit from the Environmental Engineering Department. Construction shall not commence until this permit has been issued.
29. **Miscellaneous** - Items discussed not covered in the above items 1-28 are listed below:

APPENDIX B

VDOT, CHESTERFIELD RESIDENCY - JULY 2001

NON-THOROUGHFARE PLAN ROADWAY INSPECTION & TESTING REQUIREMENTS (Trench installation, Fill sections)

1. Roadways which are not defined as arterials or collectors in Chesterfield County's "Thoroughfare Plan", nor as arterials, rural collector or Virginia Byways as defined in Powhatan County's "Thoroughfare Plan" shall be constructed in accordance with all applicable sections of the current edition of *VDOT Road and Bridge Standards and Specifications*.
2. A licensed geotechnical engineer or certified technician under the direction of a licensed geotechnical engineer shall observe the placement of all storm sewer and utility trench backfill as well as installation of man-made fills.
3. Backfill of trenches and at junctions and appurtenances shall be placed in six (6) inch lifts compacted to four (4) inches.
4. Field testing of all storm sewer, utility trench backfill, and man-made fill shall be performed in accordance with the following criteria to insure that the density meets 95% of the standard Proctor dry density.
 - Tests shall be run between every 300' for roadways (fill sections). Testing on fill sections will be required to be approved prior to stone placement.
 - Tests shall be run between structures/appurtenances at 300 foot intervals with a minimum of one (1) test per run, and will be run in the top 1 foot of the backfill and below the base of the future pavement (trench installations). Testing on trench installations will not be required outside limits of pavement/curb and gutter. Testing on trench/utility installation will be required prior to pavement placement.
 - A minimum of one (1) density test shall be performed at each junction and/or appurtenance (trench/utility installations). Testing on trench/utility installations will be required prior to pavement placement.

5. All construction methods and materials shall be in accordance with all applicable sections of the current edition of *VDOT Road and Bridge Standards and Specifications*.
6. Corresponding sections of the *VDOT Construction Manual* are to be utilized as an additional reference source.
7. Inspection services shall be provided utilizing one of the following options:
 - The applicant may retain services of licensed geotechnical engineer (or technician under the direction of a geotechnical engineer) to perform required inspection and testing, or,
 - The applicant may request that VDOT provide inspection services through the establishment of an accounts receivable with the contractor responsible for providing all required material testing.
 - The applicant may request that VDOT accept a bond for a period longer than the standard one (1) year performance bond in lieu of either (A) or (B) above. Bonding periods of two (2) to five (5) years will be considered. (Surety rates in the amount of \$33/s.f. (fill sections) and \$67/l.f. for trench installations are anticipated and could be set up on an accounts receivable basis).
8. All testing reports, certifications and/or recommendations shall be submitted to VDOT for review and approval prior to proceeding with the next phase of construction.
9. Additional testing may be requested by the VDOT inspector as deemed necessary by field conditions (i.e. when failures are observed, when unacceptable construction methods are observed, etc.)
10. A licensed geotechnical engineer shall ascertain the cause and certify the method of repair for all pavement structural failures that occur prior to state acceptance.

VDOT, CHESTERFIELD RESIDENCY - JULY 2001

**THOROUGHFARE PLAN ROADWAY
INSPECTION & TESTING REQUIREMENTS**

1. Roadways defined as arterials and collectors in Chesterfield County's "Thoroughfare Plan, and arterials, rural collectors and Virginia Byways as defined in Powhatan County's "Thoroughfare Plan" shall be constructed in accordance with all applicable sections of the current edition of *VDOT Road and Bridge Standards and Specifications*.
2. All construction methods and materials shall be in accordance with all applicable section of the current edition of *VDOT Road and Bridge Standards and Specifications*, as follows:
 - Inspection and testing of all fill embankments shall be performed in accordance with Section 305 of the current *VDOT Road and Bridge Specifications*, and,
 - Inspection and testing of all storm sewer and utility trench backfill shall be performed in accordance with Section 302 & 520 of the current *VDOT Road and Bridge Specifications*, and,
 - Inspection and testing of the aggregate base and asphalt surface course(s) shall be performed in accordance with Section 304, 309 & 315 of the current *VDOT Road and Bridge Specifications*.
 - Corresponding section of the *VDOT Construction Manual* are to be utilized as an additional reference source.
3. Inspection services shall be provided utilizing one of the following options:
 - Permittee may retain services of licensed geotechnical engineer (or technician under the direction of a geotechnical engineer) to perform required inspection and testing, or,
 - Permittee may request that VDOT provide inspection services through the establishment of an accounts receivable with the contractor responsible for providing all required material testing.

4. All testing reports, certifications and/or recommendations shall be submitted to VDOT for review and approval prior to proceeding with the next phase of construction.
5. Additional testing may be requested by the VDOT inspector as deemed necessary by field conditions (i.e. when failures are observed, when unacceptable construction methods are observed, etc.)
6. The aggregate base course shall be sealed immediately after placement through installation of the base asphalt course(s)
7. A licensed geotechnical engineer shall ascertain the cause and certify the method of repair for all pavement structural failures that occur prior to state acceptance.

VDOT, CHESTERFIELD RESIDENCY - APRIL 1, 2004

SUBDIVISION AND SITE CONSTRUCTION PLAN

GENERAL NOTES

1. All materials and construction within the public right of way or for roadways intended to be public rights of way shall be in accordance with current Virginia Department of Transportation specifications and standards.
2. Land Use Permit (CE-7) must be obtained from the Virginia Department of Transportation prior to beginning any construction within the existing state maintained right of way (including access).
3. VDOT is to receive written notification 48 hours prior to commencing with initial construction activities.
4. Prior to any construction, the contractor shall consult the engineer and verify the approval of the plans by all applicable federal, state and local agencies.
5. Preliminary design of the pavement structure for all subdivision streets shall be in accordance with the current edition of The Pavement Design Guide for Subdivision and Secondary Roads in Virginia. The completed design worksheet appendix IV shall be included with the initial plan submittal for each proposed pavement section utilizing the predicted soil support value shown in appendix I of The Pavement Design Guide.
6. The contractor shall verify the elevations of all points of connection or proposed work to existing curbs, sanitary lines, water lines, etc., prior to construction.
7. Upon discovery of soils that are unsuitable for foundations, subgrades, or other roadway construction purposes, the contractor shall immediately contact a geotechnical engineer and VDOT. These areas shall be excavated below plan grade as directed by a geotechnical engineer, backfilled with suitable material and compacted in accordance with current VDOT specifications.
8. All storm sewer design and construction to be in accordance with VDOT I & I LD-94 (D) 121.13.

9. All storm sewer pipes shall be reinforced tongue and groove concrete pipe in accordance with ASTM-C-76. Pipe within the right of way shall be a minimum CL-III or greater in accordance with current VDOT standards and specifications.
10. All pre-cast units shall be VDOT approved. Certification and VDOT stamp will be required on all units.
11. All concrete shall be class A3-AE (air entrained 3,000 PSI).
12. All entrances are to be designed and constructed in accordance with current VDOT standards. Residential lot access shall be provided per the following criteria:
 - All driveway entrance culverts are to be a minimum of 15" diameter x 20' long pipe and shall conform to PE-1 private entrance standards unless otherwise directed by the Resident Engineer. No entrance culverts are to be installed within five (5) feet of a property corner.
 - VDOT standard CG-9D entrances shall be installed in curb and gutter neighborhoods.

Inspections to be performed by VDOT shall be requested in writing, 48 hours prior to entrance installation.

13. The developer is responsible for furnishing and installing stop signs at street intersections, as well as, all signs deemed pertinent to the proposed development. The contractor shall contact the Richmond District Traffic Engineering office at 804-542-6000 to establish locations for any signage requirements as deemed necessary by VDOT inspector. Installation of said signs shall occur at no expense to the state and prior to state acceptance of roadway(s).
14. Design changes, specified materials changes and/or field changes from the approved plans need to be re-submitted to VDOT prior to proceeding with the work. A letter of explanation shall accompany the revised plans and/or drainage calculations, which must be submitted, to VDOT for review and approval by the Resident Engineer.
15. Contractor shall verify location and elevation of all underground utilities shown on plans in areas of construction prior to starting work. Contact engineer immediately if location or elevation is different from that shown on plan. If there appears to be a conflict, and/or upon discovery of any utility not shown on this plan, call Miss Utility of Central Virginia at 1-800-552-7001. The developer shall be responsible for the relocation of any utility within existing and/or proposed right of way required by the development.

16. All streetlights shall be located a minimum of 9.5' from the edge of pavement on curb and gutter streets and/or located a minimum of 5.5' behind the ditch line on open ditch streets.
17. Generally, paved roadside ditches are to be specified when velocities exceed current VDOT design criteria or when ditch slopes are less than 0.75%. Where ditch slopes exceed 5.0%, the developer may choose to implement erosion and sediment control measures in an attempt to achieve channel stabilization while acknowledging that additional paved ditch linings may be required prior to acceptance of the roads into the secondary system of state highways. Paved roadside ditches shall conform to VDOT-PG-2A standards and specifications.
18. VDOT approval of construction plans does not preclude the right to require additional facilities as deemed necessary for acceptance of the roads into the VDOT Secondary Road System.
19. VDOT approval of these plans will expire five (5) years from the date of approval.
20. VDOT shall have performed the required field inspection (proof roll) prior to placement of the aggregate base course(s). Contact VDOT, in writing, for subgrade inspection 48 hours prior to scheduling placement of aggregate base course(s).
21. A prime coat seal between the aggregate base and bituminous concrete will be required at a rate of 0.30 gallons per square yard (REC-250 Prime Coat) per VDOT standards and specifications.
22. The scheduling of aggregate base installation and subsequent paving activities shall accommodate forecast weather conditions per Section 315 of The Road and Bridge Specifications.
23. VDOT shall have approved the aggregate base course(s) for depth, template and performed the required field inspection (proof roll) prior to placement of any surface course(s). Contact VDOT, in writing, for inspection of the aggregate base course(s) 48 hours prior to application of the surface course(s).
24. An actual copy of the complete CBR report is to be submitted to VDOT in conjunction with final pavement designs. All pavement design recommendations shall be performed in accordance with the current edition of The Pavement Design Guide for Subdivision and Secondary Roads in Virginia.
25. A licensed geotechnical engineer shall ascertain cause and certify recommended method of repair for all pavement structural failures prior to state acceptance.

26. All vegetation and organic material is to be removed from the right of way limits prior to conditioning of the subgrade.
27. All materials shall be in accordance with the VDOT Road and Bridge Specifications and Road and Bridge Standards.
28. Dry gutter is not allowed in VDOT right of way.
29. The developer will be responsible for the design costs of any traffic signal installation and/or modification under an account receivable with VDOT.
30. The necessity and locations for additional VDOT standard underdrains to be determined at time of subgrade inspection.
31. Approval of a detailed construction sequencing/maintenance of traffic narrative for the work zone is a prerequisite for issuance of a Land Use Permit allowing access to and construction within VDOT maintained right-of-way.
32. VDOT shall be provided documentation by a licensed geotechnical engineer, certifying that all in-place pavements meet or exceed the approved pavement design thickness prior to state acceptance. The certifying documentation shall conform to VDOT specifications and the approved plans.
33. The establishment of a temporary vegetative cover is required on all denuded areas that are not to be fine graded for periods longer than 30 days.
34. No structure shall be constructed on state maintained rights of way unless said structures are shown on road construction plans approved by VDOT or covered by a VDOT Land Use Permit (or by a letter of intent from the Resident Engineer to issue said permit at the time of state acceptance).
35. The developer is responsible for contacting the Richmond District Traffic Engineering section at 804-524-6000 for guardrail location and placement requirements.
36. A preconstruction meeting is required prior to undertaking any roadway construction activities. Developer or designee will contact Chesterfield Residency, in writing, five working days in advance of anticipated construction start to establish date, time and location for preconstruction meeting. The primary function of the construction meeting will be to identify geotechnical parameters of proposed construction activities.

CONTRACTOR ENVIRONMENTAL CHECKLIST**Chesterfield County**

Facility Name:

Period Ending:

Person Resp	Prepared by	Reviewed by	Approved by

Revision no.

The following information is to be filled out by a company representative for the contracted work or service to be performed.

Contact person:
Position:
Company name:
Address:
Phone:
Mobile:
Fax:
Email:

Will the contracted work or service include any of the following activities?

Combustion sources	Yes/No
Air heating and supply	
Mobile transportation, such as forklift or carts	
Construction activities	
Excavation or grading	
Drilling or blasting	
Rock crushing	
Demolition	
Welding or soldering	
Painting	
Asphalt paving	
Use or storage of chemicals or fuels	
Transfer of bulk materials	
Disposal of chemical wastes	
Disposal of general wastes	

Building maintenance activities	Yes/No
Architectural paint removal	
Architectural painting	
Hydroblasting	
Sandblasting	
Surface preparation/treatments, such as floors and roof repair	
Purging or repair of distribution lines such as those for fuel, oil, or solvents	
Use of chemicals, solvents, caustics, acids, oils, etc.	
Use of herbicides, pesticides, or insecticides	

Business or work-related activities	Yes / No
Use or receipt of chemical materials (other than janitorial or cleaning materials.)	
Generation and disposal of chemical wastes	
Generation of sealers, adhesives, coatings, or paints	
Welding, soldering, brazing or similar activities	
Use of caustics or acids	
Use of combustion gases	
Please list fuels used:	
Comments	
Laboratory installation	
Medical waste	
Discharge to storm drains	

For questions or additional information regarding the use of this form, refer to the Contractor environmental management procedure, or contact the ENVIRONMENTAL OFFICE at TELEPHONE NUMBER.

Contractor representative name:	Position:
Contractor representative signature:	Date:

To be completed by the ENVIRONMENTAL OFFICE after a review is conducted.

A review of the above activities determined that:

<input type="checkbox"/>	This Contractor Environmental Checklist is approved, no further action is needed.
<input type="checkbox"/>	The Contractor Environmental Activity Statement will be issued, and a response must be received by:

Environmental administrator name:	Position:
Environmental administrator signature:	Date:

CONTRACTOR ENVIRONMENTAL ACTIVITY STATEMENT**Chesterfield County**

Facility Name:

Period Ending:

Person Resp	Prepared by	Reviewed by	Approved by

Revision no.

This environmental activities statement must be completed, signed and returned to the ENVIRONMENTAL OFFICE before the contracted work commences, or in a reasonable and agreed-upon time frame.

The following information is to be filled out by a company representative for the contracted work or service to be performed.

Contact person:	
Position:	
Company name:	
Activities or work description	
Briefly describe the activities or work to be undertaken by your company at the CITY/FACILITY site.	
Air emissions	
Will the activities or work you perform produce or cause the release of any air emissions?	
List the air emissions and methods for preventing impacts to the environment.	
Water discharges	
Will the activities or work you perform produce or cause the release of any wastewater?	
How is wastewater handled?	

Materials

What materials (chemicals, oils, etc.) and/or equipment will you be handling or bringing on site to perform the contracted work?

Training

Your employees should be trained in the proper handling of materials and equipment and in the proper response to incidents involving these materials. Describe the training your employees receive.

Waste generation

Will the activities or work you perform result the generation of any wastes?

List the amounts, types of wastes expected and the proposed disposal methods.

Are any wastes generated to be recycled?

List the recyclables, where and how they will be recycled.

Energy

Will the activities or work you perform consume energy (electricity, compressed air, natural gas, steam, etc.)?

Explain what types of energy will be consumed, and how you will minimize consumption.

Other	
Are there any other ways in which your activities or work affect and/or protect the environment?	
Please describe below.	

Information

Company name:	
Contact	
Name:	Position:
Address:	
Phone:	Mobile:
Fax:	E-mail:
Secondary contact	
Name:	Phone:

Environmental agreement

For questions or additional information regarding the use of this form, refer to the Contractor Environmental Management Procedure, or contact the CITY/FACILITY at TELEPHONE NUMBER.

I acknowledge receipt and concurrence with the Contractor Environmental Activity Briefing Package. My company and subcontractors that I may bring to the CITY/FACILITY site will abide by all such environmental programs and policies whenever on the property. My company will train all personnel contracting on the property about the briefing package. Sign-in sheets will be maintained as evidence that the training has been conducted and will be made available to the ENVIRONMENTAL OFFICE upon request.

Changes to the environmental management system will be communicated to my company by CITY/FACILITY. Retraining of affected individuals will be conducted as appropriate.

Print name: Name	Position:
Contractor representative signature:	Date:

To be completed by the CITY/FACILITY after a review is conducted.

A review of the above activities determined that:

<input type="checkbox"/>	COMPLETE - approved, no further action is needed.
<input type="checkbox"/>	NOT COMPLETE - a response must be received by:

Environmental administrator name:	Position:
Environmental administrator signature:	Date:

APPENDIX E

ENVIRONMENTAL MANAGEMENT POLICY

Chesterfield County

Facility name:

Period ending:

Person Resp	Prepared by	Reviewed by	Approved by

Revision no.

Company environmental policy

Chesterfield County

The County of Chesterfield is committed to improving countywide environmental practices, and to be responsible protectors of the environment in conformance with its mission of providing a "First Choice Community through Excellence In Public Service." In support of this commitment, the county will:

1. Meet or exceed all applicable environmental laws, regulations, and municipal standards.
2. Educate, train, and recognize employees for enhanced environmental performance and increased awareness of environmental issues.
3. Practice the principles of pollution prevention.
4. Respond to environmental incidents at county properties and facilities quickly and effectively.
5. Continually improve our environmental management system and make it an integral part of our standard business practices.
6. Develop and periodically review environmental objectives and targets as part of maintaining the county's environmental management system.
7. Promote the education of all citizens in the awareness of environmental issues and pollution prevention.
8. Encourage the use of sound environmental principles and practices by all county contractors vendors, local businesses, and industries.

This commitment to protect the environment is required of all county employees at all levels.

County Administrator

Date

APPENDIX F
TRACKING OF ENVIRONMENTAL SPILLS AND RELEASES

Chesterfield County

Facility name:

Period ending:

Person Resp	Prepared by	Reviewed by	Approved by

Revision no.

Contractors will immediately report all spills or releases of materials other than incidental ones to the CITY/FACILITY OFFICE at TELEPHONE NUMBER. Contractors will follow up by completing, signing and returning this form to the CITY/FACILITY OFFICE in a reasonable and agreed-upon time frame.

The following information is to be filled out by the contractor for the purpose of tracking environmental spills and releases. This information will be reviewed and entered into the CITY'S ENVIRONMENTAL MANAGEMENT INFORMATION SYSTEM.

Please fill in all areas, using **Not Applicable** or **N/A** as necessary to complete the form. Please print.

Contractor information:

Contact person:	
Position:	
Company name:	
Address:	
Phone:	
Mobile:	
Fax:	
Email:	

Incident description

Incident:	
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Spills

Spill/Release

Spill date:		Spill time:	
Chemical:		Quantity spilled:	
Agency notified:		Date notified:	
Date CITY/FACILITY notified:			
Clean-up method:			
Disposal method:			

Waste disposal contractor

Company name:	
Contact person:	
Position:	
Phone:	
Secondary phone:	
Fax:	
Email:	
Contractor expertise:	

For questions or additional information regarding this form, contact the CITY/FACILITY at TELEPHONE NUMBER.

Contractor name:	Position:
Contractor signature:	Date:

To be completed by the CITY/FACILITY after a review is conducted.

A review of the above incident determined that the spill/release is:

<input type="checkbox"/>	NOT REPORTABLE - no further action is needed.
<input type="checkbox"/>	REPORTABLE - contacted LEGAL COUNSEL/CONSULTANT.
<input type="checkbox"/>	Input spill/release information into CITY/FACILITY'S environmental management information system.

Executive manager name:	Date:
Executive manager signature:	

APPENDIX G

BLASTING REQUIREMENTS

MEETING AGENDA FOR A BLASTING SURVEY THAT IS REQUIRED BEFORE BLASTING CAN BEGIN IN A RESIDENTIAL NEIGHBORHOOD.

Before any blasting can commence a blasting survey must be conducted in order to assess the quality of residential homes within a 500 feet radius. This survey will form a database of pre-blast and post-blast structural conditions of the buildings in the area and allow the construction team to maintain a safe guard on liability. The county Utilities department and blasting company will conduct a meeting in order to explain the project, why the blasting is needed, why a pre-blast survey must be performed, and alleviate any fears or concerns the citizens might have.

Because the use of blasting is required it is important to notify families within the 500 feet area in an upfront and honest way. The families will have questions and concerns. The meeting will be scheduled well in advance of the blasting activity to allow for the survey to be conducted in an honest and thoughtful manner allowing the families to feel more comfortable about the situation.

Notification Methods:

- A. Notify families, by letter, two weeks prior to the meeting.
- B. Notify families, by hand delivery, with a notice one week before scheduled meeting.

Contents of the Letter/Memo:

The letter should contain the following items of information:

Date: Two weeks before scheduled meeting.

Location: Meeting will be held at Bon Air Library.

Attendees:

Blasting Company or Pre-blast survey company.

Chesterfield County Officials - Utilities, Director, Risk Management, Loss Prevention Manager.

Representatives from each household.

Purpose of the meeting:

Describe the construction project and explain the need for the blasting due to the rocky soil conditions. The letter will also contain brief information regarding the following items:

- Description of a blasting survey, what it is for, and how it shall be conducted.
- Describe who will be conducting the survey
- Blasting company representatives.

- Items of Importance:

The importance of attending the meeting by at least one representative of the household in order to gain knowledge of the survey, why it is needed and allow time for questions and answers.

Meeting Agenda:

This agenda will be handed out at the meeting site. The agenda will cover several key items and will be lead by specific personnel as follows:

1. Construction Project Overview - Importance and need of the water line: Utilities Manager.
2. Definition of the blasting procedure / soil conditions: Blasting Company.
3. Discuss operation and safety issues of blasting: Blasting Company.
4. County regulations and requirements: County Fire Marshall.
5. Define and describe the blasting survey, the purpose of the survey, and the process of conducting the survey: Blasting Company.
6. How and when the survey will be conducted:
 - a. Date, time, and location.
7. Discuss the post evaluation survey, when and how it will be conducted.
 - a. Within one week after the blast.
8. Questions and Answers: All Attendees as necessary.

After the meeting there will be a sign up sheet. Each family should choose two (2) different dates and times when at least one responsible family member will be home for the survey.

By allowing the families to choose two different times, the survey team will cut down on "no-shows" or "emergencies" so a complete survey can be made prior to the blast.

As part of the sign up sheet, notify family members that the construction team will hold families accountable to those times and dates and will assume no liability if after two attempts to conduct the survey no access was gained to the structure.

The Meeting should be concluded within two hours. Additional time will then be available for the families to sign-up for the survey.

INSURANCE REQUIREMENTS:

The Contractor shall provide adequate protection for all utilities (power, communication, water, sewer, etc.) and private property which may be endangered by the performance of the work of this Contract. Liability insurance shall be required to cover injuries or damages to persons or property that might result from blasting operations in the minimum amounts of:

General Liability insurance \$5,000,000 Each Occurrence insuring the blasting operations and naming Chesterfield County as an Additional Insured.

Commercial Automobile Liability \$1,000,000 Each Occurrence combined single limit

Workers Compensation Insurance Statutory Amount:

NOTICE TO NEIGHBORHOOD:

At least 30 days before the initiation of blasting operations, the contractor must notify, in writing, all residents or owners of dwellings or other structures within 500 feet of the permit area of how a pre-blast survey may be requested. They must also notify the public, by publication in a local newspaper at least 30 days before the initiation of blasting. Survey requests received more than 10 days before the initiation of blasting will be conducted before blasting begins.

NEIGHBORHOOD MEETING REQUIREMENT:

At least 15 days before the initiation of blasting operations, the contractor must meet with interested residents or owners of dwellings regarding the blasting operations. Coordination with Chesterfield County Public Affairs regarding the publication of the meeting and the meeting agenda is required.

PRE-BLAST SURVEYS OF STRUCTURES WITHIN 500 FEET OF THE BLAST SITE:

Pre-blast surveys shall be offered to the owners and/or occupants of structures and utility lines located within 500 feet of the blast site. The pre-blast surveys shall be conducted by a firm regularly engaged in performing pre-blast surveys and which is independent of the blasting contractor. The pre-blast surveyor shall promptly conduct a pre-blast survey of the identified structures unless permission for a survey has been denied by the owner or occupant of the structure, or after due diligence on the part of the surveyor, contact with the owner or occupant of the structure could not be made. The surveyor shall promptly conduct a pre-blast survey of utility company structures if a utility company representative requests one from the surveyor.

WRITTEN REPORTS:

The surveyor shall determine the condition of the dwelling or structure and shall document any existing damage and other physical factors that could reasonably be affected by the blasting. The surveyor shall examine the interior as well as the exterior structure and shall document any damage by means of photographic or videocassette methods. Structures such as pipelines, cables, transmission lines, cisterns, wells and other water systems warrant special attention; however, the assessment of these structures may be limited to surface conditions and other readily available data.

The written report of the survey shall be signed by the person who conducted the survey. All surveys shall be completed by the surveyor before the initiation of blasting. All surveys shall be conducted by a disinterested third party, regularly engaged in performing pre-blast surveys.

All photographs shall be identified by number. The written report shall be signed by an authorized representative of the company or firm that performed the pre-blast surveys.

COPIES OF PRE-BLAST SURVEY REPORTS:

Copies of the pre-blast survey report shall be promptly provided to the contractor and made available to the Fire Marshal and Utilities Department. Upon request, the contractor shall provide to the owner of the structure making the request, a copy of the pre-blast survey of the requesting party's surveyed structure. The contractor may not charge the owner or occupant for a copy of the pre-blast survey.

NOTICE:

The Utilities Department contract administrator shall be informed in writing no later than 48 hours prior to the start of blasting.

INITIATION OF BLASTING OPERATIONS:

Before the initiation of blasting operations, the pre-blast surveys shall be completed, unless permission to conduct a pre-blast survey has been denied or contact with the owner or occupant of the structure could not be made after due diligence on the part of the surveyor to make such contact. The contractor shall submit to the Fire Marshall and Utilities Department a copy of a pre-blast survey log which contains a list of properties and/or utility lines eligible for pre-blast surveys, and which shows a list of properties and/or utility lines that received pre-blast surveys.

Blasting may commence only if the pre-blast neighborhood meeting is held, pre-blast surveys are completed, or permission to conduct a pre-blast survey has been denied.

The Contractor shall participate in a "pre-construction meeting" with the County's Loss Prevention Manager prior to the commencement of any blasting related to this project.

PERMIT POSTING:

The contractor shall cause to be posted in a conspicuous location, accessible to the public, a weather protected copy of the site map, a copy of the permit to use or possess explosive materials issued by the Chesterfield County Fire Marshall, and copies of the permits to blast explosives for all on-site personnel responsible for blasting operations

PROTECTIVE MEASURES:

Immediately prior to the blast, the blast area shall be cleared of all vehicular and pedestrian traffic.

All traffic shall be stopped and shall be prevented from entering the area until the blaster gives permission. Signs shall be posted to inform the public of blasting operations and to turn off radio transmitters. Precautions necessary shall be employed to ensure that persons are not injured and that adjoining property and structures, including public utilities are not damaged.

BLASTING OPERATIONS:

1. Distance from structures. There shall be no blasting within one hundred feet of any structure or utility line unless the owner of the structure(s) and/or utility line(s) consent in writing.
2. General. Blasting operations shall be conducted only by approved, competent operators familiar with the required safety precautions and the hazards involved. Blasting operations shall be performed in accordance with the instructions of the manufacturer of the explosive materials being used.
3. Blasting in close proximity. When blasting is done in close proximity to a structure, railway or highway, or any other installation, precautions shall be taken to minimize earth vibrations and air blast effects. Blasting mats or other protective means shall be used to prevent fragments from being thrown.
4. Restricted hours. Blasting operations shall only be conducted during daylight hours.

5. Personnel. Persons in charge of blasting shall not be under the influence of alcohol or drugs which impair sensory or motor skills, shall be at least 21 years of age, and shall demonstrate knowledge of all safety precautions related to the storage, handling or use of explosives or explosive materials
6. Open flames and lights. Smoking, matches, flame-producing devices, open flames, fire arms and firearms cartridges shall not be permitted inside of or within the blast site.
7. Blasting safeguards. Before a blast is fired, the person in charge shall make certain that surplus explosive materials are in a safe place, that persons and equipment are at a safe distance or under sufficient cover, and that a loud warning signal reasonably calculated to be heard by individuals not less than 100 feet of the blast site has been sounded.
8. Electric detonator precautions. Precautions shall be taken to prevent accidental discharge of electric detonators from currents induced by radar and radio transmitters, lightning, adjacent power lines, dust and snow storms, or other sources of extraneous electricity.
9. Non-electric detonator precautions. Precautions shall be taken to prevent accidental initiation of non-electric detonators from stray currents induced by lightning or static electricity.
10. Non-sparking tools. Tools used for the opening and closing of packages of explosive materials, other than metal slitters for opening paper, plastic or fiberboard containers, shall be made of non-sparking materials.
11. Only manufactured firing devices designed for use with the detonators selected shall be used.
12. All apparatus shall be kept in perfect order and shall be thoroughly inspected before and after each blasting operation.
13. All wiring connected to electrical firing devices shall be properly and adequately insulated.
14. Disposal of packaging. Empty containers and paper and fiber packaging materials that previously contained explosive materials shall be disposed of or reused in an appropriate manner.
15. Only such explosives as are absolutely necessary for the performance of the work shall be brought to the Site.
16. Abandonment. Explosive materials shall not be abandoned.
17. Other regulations. Blasting operations shall be conducted in accordance with federal, state and local regulations.

BLAST RECORDS:

A record of each blast shall be kept and retained by the contractor for at least five (5) years and shall be available for inspection upon request by the Fire Marshall or owners of property within 500 feet of the blast site or as provided by law. These records shall contain the following minimum data:

- a. Name of blasting contractor
- b. Pre-blast survey records
- c. Location and time of blast
- d. Name of certified blaster in charge
- e. Type of material blasted
- f. Number of holes bored and spacing
- g. Diameter and depth of holes
- h. Type and amount of explosives
- i. Amount of explosives per delay of 8 milliseconds or greater
- j. Method of firing and type of circuit
- k. Identification, direction, and distance, in feet, from the nearest blast hole to the nearest building or structure outside the permit area.
- l. Whether or not mats or other precautions were used
- m. Type of detonators and delay periods
- n. Type and height of stemming
- o. Seismograph and airblast records
- p. The wind direction and approximate speed at the time of the blast
- q. The general atmospheric conditions at the time of the blast

POST-BLAST SURVEY OF STRUCTURE:

If a complaint is made, or a claim of damage is stated, the contractor shall, with the owner's consent, have the surveyor conduct a post-blast inspection of the structure in question. The surveyor, blasting contractor, and/or insurance agency representative shall investigate each complaint or claim thoroughly using where appropriate the surveyor's written report to compare pre-existing damages with those being claimed.

CLAIMS:

The Contractor shall be responsible for the management of all claims whatsoever arising from the hauling, handling, use of and storing of explosives and all effects, direct or indirect, of the blasting operation. The Contractor shall be responsible for and shall make good any damage caused by the blasting or by accidental explosion of any explosives intended for use on the Works or stored on the Site. All costs associated with the protection of and repair of damage to structures, utilities and property, shall be borne by the Contractor regardless of whether the work is performed by the Contractor or the respective owner.